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AN OBJECTIVE COMPARISON OF ACHIEVEMENT IN THE BASIC SUBJECTS FOR MATCHED GROUPS OF CHILDREN IN MANCHESTER, ENGLAND AND EDMONTON, ALBERTA

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by

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ABSTRACT

The purpose of this study was to compare the achievement in the three basic subjects (reading, arithmetic, language) of selected groups of nine-year old children, and fourteen-year old children in Manchester, England and Edmonton, Alberta.

The representative sample used was composed of one hundred and sixty-nine children at the nine-year old age level in each city, and one hundred and seventy-three children at the fourteen-year old age level in each city. Children in the total-group samples in each city were matched according to total intelligence test scores on the California Short-Form Test of Mental Maturity.

The total groups in the two city samples at each age level were also further sub-divided into boys, and girls for comparisons in achievement relative to the two sex groups in the two cities.

That group of children who obtained I.Q. scores above 130 on the California Short-Form Test of Mental Maturity at both age levels were also sub-divided from the total groups for a comparison of achievement scores when higher levels of intelligence are considered.

A brief summary of the organization of the school program, and the curriculum for instruction in the Manchester and Edmonton schools was included in this study to provide a background for the interpretation of the findings.

In order that the testing instruments used might be as fair to both national groups as possible, achievement tests that have been published on both sides of the Atlantic were used in the experiment. These

achievement tests were: the complete battery of the California Achievement Tests (Elementary and Junior High forms), the Schonell Spelling Test (Form A), the Watts Sentence Reading Test, and the Vernon Sentence Reading Test.

Mean scores, and the variances of the scores for the total group, and the sex sub-groups in each city were calculated from the resulting data, and used to determine relative achievement in the three basic subjects for the children concerned. Non-parametric statistical tests were used to compare the scores for the intellectually-gifted children.

This statistical analysis revealed that generally no significant differences in the mean reading scores of the children in the total groups, or the sub-groups in the samples from the two cities existed when the Watts Sentence Reading Test, or the Vernon Sentence Reading Test were administered. Both of these tests of reading achievement were published and standardized in England.

However the mean achievement scores of the Edmonton children in the sample at both age levels were significantly higher than those of the Manchester children on the complete battery of the California Achievement Tests, and on the Schonell Spelling Test. This superiority in the mean scores of the Edmonton children was maintained for the separate sub-tests of the California battery with the exception of the Arithmetic Fundamentals sub-test on which the Manchester nine-year old children did significantly better than their Edmonton counterparts. All significant differences in the scores in favour of the Edmonton group were maintained when the two sex sub-groups were compared, but not when only those children with I.Q. scores above 130 were compared.

Although the mean achievement scores for the majority of the tests used in this experiment were significantly higher for the Edmonton children in the sample than for the comparable Manchester children, the reverse trend tended to be true for the variance of the scores on all of the achievement tests used in the experiment. The scores for the Manchester children showed a significantly wider spread than those of the comparable Edmonton children, which appears to indicate that the program of instruction in the Manchester schools caters more adequately for individual differences in the learning abilities of the children in its system.

The significant differences in the scores for the samples from the two cities might be attributed to the testing instruments used, to the selectivity of the Edmonton sample (nine-year old children and fourteen-year old children who had not progressed at the normal rate of one grade per year were excluded from the Edmonton sample), to the differences in the curriculum content and methods of teaching in the two school systems, and to general differences in the nature of the countries, of which the two school systems are a part.

However, it seems fair to conclude from a study of the test results in this experiment that the children in Edmonton schools tend to achieve at a higher uniform performance rating in the three basic subjects measured by the California Achievement Tests, and the Schonell Spelling Test than their Manchester counterparts at both age levels. This conclusion however does not apply to reading achievement tests that have been published and standardized in England, and with which the English children are likely to be more familiar. It is further

evident that the program of instruction in the three basic subjects in the Edmonton schools does not provide for the same differentiation of achievement according to the individual pupils' potentials as the less prescriptive program of instruction in the Manchester schools. Particularly evident from these test results is the failure of the program of instruction in the Edmonton schools to enable the intellectually-gifted children to achieve in the basic subjects at their maximum potential.

ACKNOWLEDGMENTS

The writer wishes to express appreciation to the Educational Authorities in the cities of Manchester and Edmonton for granting their permission to gather the data for this study, and to the school principals and the class teachers in the selected schools of Edmonton and Manchester, who supervised the administration of some of the achievement tests. Special appreciation is expressed to the five teachers in the Manchester Remedial Reading Service, who administered the achievement test to the fourteen-year old children in the Manchester sample. To Dr. W. Langon, psychologist in the Manchester Child Guidance Clinic, who assisted in the original planning of the Manchester testing program, the writer wishes to express gratitude.

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CHAPTER I

THE PROBLEM

The current criticism, which belittles education on this continent, in comparison with the European, demands that objective evidence concerning achievement in the basic subjects should be obtained. The main basis for this criticism seems to come from the scientific and technological advances made in Russia, particularly in recent years, and it is inferred that these advances reflect a superior educational system with far higher standards of achievement on that side of the Atlantic.

Trace's book, What Ivan Knows that Johnny Doesn't (39) and other similar books have stated these criticisms in a very convincing, if not always objective manner, and have caused increasing concern among educators and the general public regarding the general standards of education on this continent, in relation to those of other countries.

At the present time, almost no definite evidence exists upon which to base our convictions, one way or the other regarding relative attainment in the basic subjects on either side of the Atlantic. Those research studies that have been completed indicate that the favourite proposition of the critics stating that all educational problems in our schools would practically disappear if our methods of teaching, and our curriculum were modelled after the European system certainly needs careful testing. The amount of actual research on educational achievement in our own country of Canada as compared to that in any other nation is extremely limited.

The purpose of this study is to compare achievement in the basic

subjects (reading, arithmetic and language) for matched groups of children in Manchester, England and Edmonton, Alberta.

The major question: Is there equality of achievement in the basic subjects between two selected groups in Manchester, England and Edmonton, Alberta of approximately the same chronological age, and who possess the same intelligence test quotient?

An attempt was made to match the groups according to chronological age, and intelligence test scores on the _California Short-Form Test of Mental Maturity,_ but such matching has not been completely achieved. Children of chronological ages, nine and fourteen years were included in the sample in both cities. These two age groups were selected so that the comparative attainment in the two cities could be studied at two different levels of the educational system. Since most children in Manchester begin school almost one year earlier than their Edmonton counterparts, and therefore may exceed the progress of Edmonton children in their early school years, it is important to compare test scores for older children in both cities to see whether this initial advantage, if it exists has a continuing effect on school achievement.

Nine-year old children in Manchester have usually attended school for four years. Most children of the same age in Edmonton have been in school attendance for three years. Fourteen-year old children in Manchester have attended school for nine years. Most children of the same age in Edmonton have been in school attendance for eight years. However testing arrangements for the children in both sub-samples included in the study made it possible to test both groups of children during their fourth and ninth years in school respectively.

STATEMENT OF SUB-PROBLEMS

In addition to furnishing evidence relative to the central problem of this study, these sub-problems will also be investigated.

1. How do the areas of strength, and of weakness in the three basic subjects of the Edmonton pupils compare with the areas of strength, and of weakness in the three basic subjects of the Manchester group?
2. Is there equality of achievement in the basic subjects between the two national groups when these two groups are sub-divided and the sex factor is considered?
3. Is there equality of achievement in the basic subjects between the two selected national groups when levels of intelligence are considered, and only those children with total I.Q. scores above 130 are considered?
4. Is there equality of achievement in reading between the two selected national groups when reading tests standardized on the North American continent are administered, as well as when reading tests standardized in England are used?

HYPOTHESES

In order to find answers to these problems, the following hypotheses were tested in this study.

I There are no significant differences between the total mean scores on the complete battery of the California Achievement Tests for the nine-year old group, nor for the fourteen-year old group in either city.

II There are no significant differences between the mean scores on the Watts Sentence Reading Test (for the nine-year old group) and the Vernon Sentence Reading Test (for the fourteen-year old group) for the comparable groups in either city.

III There are no significant differences in the spelling scores on the Schonell Spelling Test for the nine-year old group, nor for the fourteen-year old group in the samples from the two cities.

IV There are no significant differences in achievement scores on any of the tests administered to the matched groups in either city when the sex factor is considered.

V There are no significant differences in achievement scores on any of the tests administered to the matched groups in either city when higher levels of intelligence are considered.

DEFINITION OF TERMS

A supply teacher is a temporary teacher in England, who may be moved from school to school by the Education Authority in accordance with the need for additional staff members at different schools.

The basic subjects are those subjects tested by the complete battery of the California Achievement Tests (reading, arithmetic, language).

Language refers to those aspects of this complex subject, which are measured by the language sub-tests of the California Achievement Tests. These sub-tests include objective test items on capitalization, punctuation, word usage, ability to recognize complete and incomplete sentences and spelling.

Attainment is a term used more frequently in England synonymously with the term "achievement" in Canada. Both terms are used interchangeably in this thesis.

Head Teacher refers to the person in English schools, who fills the same position as the school principal in Canadian schools. Because of the independence in matters of curriculum that is granted to each individual school in England, the responsibilities of the head teachers in English schools appear to be of even greater significance than those of the Canadian school principals.

The "Eleven plus" is the examination that children in English schools take when they are eleven years of age. The results of this examination are used as a basis for planning their future educational placement in a Grammar School, a Technical School, or a Secondary Modern School.

> Three short tests constitute the eleven plus examination, each three quarters of an hour long, dealing with verbal competency, general intelligence and arithmetic reasoning. Tests are scored by panels of teachers, they are not machine-scored; no versions of the test are available ahead of time; a short English essay is always a part of the test. (27, p. 18)

Streaming is a method of classifying pupils that is in common use in British schools, and is used in some Canadian schools.

> This is a term used for tracks or levels of ability in English schools. Usually there are three or four streams (A B C D) in the modern secondary school; student allocation to a stream is made by the staff. (27, p. 117)

The basis used for classifying the pupils into streams in Canadian schools varies in different educational areas.

Mental Arithmetic is the section of the arithmetic course in

English schools, which deals with the ability to do relatively involved arithmetical computations without the use of a pencil.

English is a subject in the curriculum of the English Secondary Schools that includes all aspects of the language arts.

Continuous Progress System: This administrative system for classifying pupils is in common use in Edmonton schools. By this system, groups of pupils are enabled to progress through the grade system, completing all of the prescribed curriculum content at a faster or slower rate than the average progress of one grade per year.

Curriculum in this experiment is limited to its narrower definition of "the written course of studies."

Nine-Year Old Children in this experiment refer to those children attending the second year of the Junior School in the Manchester city sample, and to those children attending the fourth grade of the Elementary School program in the Edmonton city sample.

Fourteen-Year Old Children in this experiment refer to those children attending the third year of the Secondary School in the Manchester city sample and to those children attending the ninth grade of the total school program in the Edmonton city sample.

SPECIAL PROBLEMS INVOLVED IN INTERNATIONAL COMPARISONS OF SCHOOL ACHIEVEMENT

All educational systems are developed in the context of the society which they serve, and it is very difficult to compare the educational attainments of groups of children in different nations without considering the aims and objectives of the educational system of each nation.

Hollinshead summarizes this idea when he states that

> In a sense about all one can compare in different systems is the philosophy because an educational system illustrates the social, political and cultural ideals of a nation. (13, p. 91)

These ideals may be very different in any two nations. However, advances in formal testing procedures in recent years, and more careful thought to sampling procedures and experimental design have made it possible to gain much useful information through the administration of formal objective tests in selected countries. It should always be recognized that an objective comparative evaluation of school attainment in the two selected countries can only be considered a partial evaluation of the two educational systems concerned.

Several problems relative to objective testing in two different countries may still present serious difficulties in comparative research. These problems include the difficulty of identifying suitable tests to give an equally fair assessment of achievement in the two countries, test sophistication, differences in age of school entry, differences in the school curriculum, and difficulties in obtaining representative samples of the total school population.

SIGNIFICANCE OF THE STUDY

Comparative studies in all aspects of education are becoming increasingly important and frequent in recent years. The renewed emphasis on scientific advancement, and concern that one's country should fall behind others in this field explains part of this new interest in the educational systems of other nations. It is also true that the increasing

opportunities for exchanges between countries in the field of education have added impetus to these comparative studies. It is therefore increasingly more important that objective studies of the standards of achievement between matched groups in many of the nations of the world be undertaken. An educational system is always relative to time and place, but there is a definite need for more objective comparative studies at the present time.

This study, comparing the educational achievements of children in Manchester, England and Edmonton, Alberta has particular significance from the Canadian point of view. The British educational system has formed the basis for much of our educational development. Only in recent years have we tended to follow more closely that of the United States. We can still today learn a great deal from British school practices. However, we have also learned from many other nations, and have developed many successful innovations of our own. We must test school achievement as a result of these differences from the British system, and try to identify the most successful educational practices in both countries.

Some attempt is made to suggest reasons for the obtained results of this study. It should then be possible to consider the desirability of possible modificiations of the factors, which account for these results. Our perceptions of our own educational problems should become more acute when we see the results of our educational system compared with those of another country. "To know thyself, compare thyself to others." (Torquato Tasso).

Further significance of studies of this type comes from the impact

they may have on the current belief that European education is far superior to any that is given on this continent. Many projects of this type are needed to test the validity of this belief.

CHAPTER II

BACKGROUND OF THE STUDY

During the school year of 1958-59, the writer was employed by the West Riding of Yorkshire County Education Committee as a supply teacher in the schools of that County. The great variability of standards of achievement in the English schools visited was observed. The opinion that achievement in the basic subjects of children in English schools was far superior to that of children in Canadian schools was frequently expressed by English teachers and the lay public. The writer's observations did not confirm this opinion.

When an opportunity for a second visit to England was provided in the school year of 1961-62, this comparative study was undertaken. The basic difficulties involved in such a study have previously been discussed and the attempts to overcome them will be included in a later section, but it is felt that such studies remain more useful than several of the observation reports that can be read in current literature. Such observations are always viewed through "the eyes of the viewer" and objectivity of any nature is often lacking.

However, it is most important that the results of studies of this type are interpreted in terms of the countries, and the school systems within these countries of which the children in each sample are a part. It would be wrong to read the Manchester results while mentally visualizing the Edmonton School System. A brief description of the English School System with particular emphasis on the organization of education in the Manchester area based on reports in the literature, and the writer's

observations and inquiries is therefore included in this study. Special emphasis is placed on comparison with the Edmonton School System, wherever marked differences in the school organization, school curriculum, teaching methods or materials occur.

GENERAL ORGANIZATION

The general direction of the educational program in Great Britain is determined by the Ministry of Education. Its chief function is to formulate and implement general educational policies. The members of its staff may inspect, appraise, and give needed help to teachers and school administrators, but they do not dictate specific content or teaching procedures related to instruction. It is the local educational authorities (in this case, Manchester), who begin to determine the curriculum, materials, and the methods of teaching used, but the final decisions remain with the head teacher and staff of each individual school.

King, in his book, entitled Other Schools and Ours summarizes the role of the British Ministry of Education in relation to the local educational authorities and the head teachers of the individual schools with this statement.

> The Ministry of Education does not own or operate any schools, employ any teachers, or draw up any syllabus. The local education authorities are allowed to develop as they like within reasonable limits. The final determination of curriculum is left to a considerable degree to the head teachers of the schools. There is nothing like the centralized direction found in American schools. (16, p. 75)

As a result of this decentralization of authority in relation to educational practices in Britain, instruction in any of the three basic

subjects assessed in this study may vary to a much greater extent in different schools in the city of Manchester than would be possible in the Edmonton city schools.

In Edmonton, the curriculum is much more definitely prescribed by the Department of Education of the Government of Alberta. General topics of study as well as the actual books to be used, and other teaching materials are prescribed by this department, and all schools in Edmonton tend to adhere to this prescription.

However, the variation existing in the practices of different English schools is usually over-emphasized in written reports, and discussions of the school systems in that country. There are many more similarities than differences in the basic educational program at comparable levels in all schools throughout the country, and the basic administrative organization at different age levels as described in the following paragraphs is uniform in the city of Manchester, and also in other parts of England.

SCHOOL ORGANIZATION

Children in Manchester enter the reception class of the Infant School at the beginning of the term in which they reach their fifth birthday. This age, as has been previously mentioned is approximately one year younger than the average chronological age of children beginning school in Edmonton. In addition to the earlier formal school entrance of Manchester children, many of them attend State Nursery Schools, when they are three and four years of age. Some Edmonton children attend Private

Kindergartens and Play Schools when they are five years of age.

At the age of seven (with the exception of a very small number of all-age schools, which have still not been reorganized in accordance with the 1944 Education Act), children in Manchester are promoted to the Junior School, in which they begin a four-year program culminating with the taking of the secondary school entrance examination at eleven years of age. This examination attempts to differentiate among the academically talented, who receive places in the Grammar Schools, those with technical aptitudes, who then proceed to the Technical Schools, and the great majority of the population, who attend regular Secondary Modern Schools. There is a growing number of Comprehensive Schools, to which children can go, regardless of their scores on the "eleven plus" examination.

> Within these Comprehensive Schools, students are usually grouped into 'streams' on the basis of their ability, as evidenced by examination results, grades and teacher ratings. (15, p. 197)

No examination, with the purposes of the "eleven plus" examination exists in the Edmonton educational program, and the effect of this examination on curriculum, time allotment to specific subjects, and motivation for both pupils and teachers must certainly be considered.

The Edmonton child's school career may take him through twelve grades beginning at the age of six years. These twelve grades are divided into the Elementary School years (grades one to six), the Junior High School years (grades seven to nine) and the High School years (grades ten to twelve). Examinations set by the Department of Education are taken by the pupils at the end of the ninth grade, and the results of these examinations are considered in the determination of the type of program that

the student will take in the Composite High Schools of the city. Some of the High School courses remain uniform for all the enrolled students.

The official school-leaving age in Manchester is fifteen years. The same age is the legal requirement for continuing school attendance in Edmonton. Currently some consideration is being given by the Ministry of Education in London to raising the school-leaving age to sixteen years for all pupils enrolled in English schools.

Approximately thirty-five per cent of the children in Manchester continue to attend school beyond the official school-leaving age. These are the children in the Grammar and Technical Schools, and in the top "streams" of the Secondary Modern Schools, who are preparing for many different external examinations, which may lead them to the Universities, Teacher Training Colleges, Training Schools for top industrial positions, etc. Most of these English children continue attending school until the age of eighteen. Those children in Edmonton, who continue with their High School program complete the twelfth grade at this same age.

However, the curriculum for the Manchester children in their last two years at school (sixteen to eighteen years) differs markedly from that of the Edmonton children. In the British program, there is much greater opportunity for specialization in the field of the pupil's major interest with the opportunity to discontinue other subjects of lesser interest, and generally lower achievement, after a basic standard of achievement has been reached. The required subjects for the Senior Matriculation Program for twelfth grade children in Edmonton are almost uniform for all students, and certainly must correspond to a prescribed pattern.

THE SCHOOL YEAR

Free schooling begins at the commencement of the first term after the child reaches the age of five in all Manchester schools. Most Edmonton children enter school at six years of age, but school attendance does not become compulsory until the child is seven years of age.

Each school year in Manchester is made up of three terms, each of about thirteen weeks in length. Twelve weeks holiday during the year is usual. Schools in the Manchester area tend to have a two-week holiday at Christmas, two weeks at Easter, two weeks at Whitsuntide, and five weeks during the summer. Three extra days are added to week-ends in February and November to give a half-term break.

In Edmonton, children attend school for a ten-month term beginning in September and ending in June. Approximately ten days make up the Christmas vacation period, and an additional ten days are granted at Easter. The number of possible days for school attendance (two hundred days in any school year) is the same in both cities.

Manchester schools have a five-day week, and a five and one-half hour school day. This time allotment is comparable in Edmonton schools.

CURRICULUM AND TEACHING METHODS

The Infant and Junior Schools tend to be the more progressive parts of the Manchester education system in relation to experimentation in curriculum and teaching methods. The same statement can be made about the elementary schools in Edmonton.

It has previously been indicated that the choice of the school's curriculum in Manchester is left almost entirely to the particular school, but the influence of external examinations (at eleven years of age, and at various levels of the secondary school program) tends to foster a certain amount of uniformity throughout the city schools, as well as in other parts of the country. This tendency to uniformity increases at higher levels of the British educational system.

Uniformity in the actual curriculum, or content to be taught is mandatory in Edmonton schools, but the major responsibility for the procedures used in teaching the prescribed topics lies with the individual classroom teachers.

Curriculum and teaching methods for the three basic subjects tested in this study are particularly relevant. In the following discussion of these three subjects, initial emphasis is placed on the Manchester programs. Differences from the Edmonton programs, where they exist are more definitely identified in the concluding paragraphs.

CURRICULUM AND INSTRUCTION IN READING

Gray (12) in his address to the International Reading Association's Conference in 1958 made some very pertinent statements about the teaching of reading in Great Britain. He had just returned from a tour of Great Britain, which had included an opportunity to visit many English schools in their regular sessions. He had also conferred with teachers from England and Wales, who were currently in the United States. A summary of some of his pointed observations follows. The majority of his generalized

statements could equally apply to the teaching of reading in Edmonton. Marked differences from the reading program in Edmonton will be indicated.

1. A liberal policy has been adopted with respect to the methods used in teaching beginning reading. An adequate picture of the methods used cannot be given in a brief space, but it is possible to differentiate two contrasting forms of approach. These two approaches are the synthetic or phonic method, and the analytical approach including the "look and say", sentence, or global methods.

   More common in Edmonton is a combined analytic-synthetic approach to beginning reading instruction, rather than the definite use of one or the other method exclusively. This same combination of methods can be observed in some Manchester schools, but there are also many others that adhere more strictly to one definite approach.

2. Systematic instruction in reading continues throughout the primary grades, that is, to age 11. At all stages of the Junior School (ages seven to eleven), reading is assumed to have two definite distinct functions, and is taught accordingly. These two functions are to acquire needed information, and to exercise the imagination and enrich experience.

   Systematic instruction in reading in Edmonton schools continues throughout the elementary school to the end of grade six (twelve years of age) for all students. Both of these functions of the reading program receive primary emphasis in the last three grades of the elementary school.

3. Keen interest in the development of improved methods of teaching

pupils to read is evident among English teachers. Practice varies all the way from the use of no basal readers in some schools to their systematic use throughout the primary school in developing essential attitudes, understandings and skills.

This keen interest in improved methods and approaches to the teaching of reading is also very evident among Edmonton teachers. Basal readers authorized by the Department of Education are used in the first six grades of all Edmonton schools.

4. Systematic teaching of reading is emphasized largely in the lower grades. The steps taken in the more advanced grades depend largely on the reading needs of pupils and the judgment of teachers. Instead of a planned program at the more advanced levels, the pupils are given specific help as needed.

The trend toward the systematic teaching of reading beyond the sixth grade (twelve years of age) seems more evident in Edmonton than in Manchester. British educators are beginning to think in terms of a more definite reading program in the secondary school, but such programs have actually been instituted in some Edmonton Junior High Schools.

5. The basal readers used in English classrooms are not as carefully graded as on this continent. They are arranged in sequence but their placement is not defined in terms of grade levels. Groups of pupils advance through a series of basal readers as rapidly as their capacity permits.

Edmonton children may use any one of the three authorized basal

reading series for grades one to six. All three series that are authorized for the primary grades, and the upper elementary grades are written and published in the United States. The practice of using readers, designed for a particular grade in that grade only is strictly followed, unless the class concerned is an accelerated group in the Continuous Progress System, and will be advancing to the following grade in the middle of the school year.

6. Special periods for recreational reading are provided from the beginning for the Manchester children. Poor readers select a book of real interest and are taught by the usual methods.

Recreational reading is encouraged from the earliest stages in the reading program of Edmonton schools. However, a definite time allotment in the class timetable, as in the Manchester schools is not usual in the timetables for Edmonton classes.

Fleming (10) also summarizes present British trends in the teaching of reading. He refers to the optimism caused by a recent Ministry of Education report that indicated significant improvement in the reading achievement of English school children in the years between 1948 and 1956. Similar trends in the reading achievement of children on this continent have also been identified.

Fleming (10) also notes:

(a) the recent marked increase in the number of surveys of reading achievement throughout the country,
(b) the lively concern with the provision and circulation of suitable materials, and with experimentation as to methods and devices, and
(c) the fact that book production and the purchase of newspapers

> is estimated to be proportionately higher in Britain than in any other country.

(Statements 'a' and 'b' would also be applicable to Edmonton).

He also refers to the "mixed" methods of teaching reading in English schools with the emphasis on introductory pictures, a limited vocabulary, reading for fun, and very little systematic phonic analysis at the earliest stages. The method of teaching reading in Edmonton schools through the use of the basal readers could certainly be called a "mixed" method, but a basic systematic phonics program begins in the middle of the first grade in most classrooms.

Fleming (10) also notes that the need for elementary instruction in reading in the Junior Schools, as well as in the Infant Schools is becoming increasingly recognized. This trend might be comparable to our current interest and concern with the Division II program of reading instruction in all Alberta schools. He further adds that there is a notable increase of interest in the processes by which children begin to learn to read, and in the study of these processes in the light of modern interpretations of perception, and of thinking.

In the summary of his observations, Fleming makes the following statement:

> Clearly established is the complexity of the process of reading, in which as in the comparable task of learning to perceive, both stimulus and response are now known to have a greater complexity than was formerly supposed. (10, p. 79)

This aspect of research in reading is also receiving increasing emphasis in the Edmonton area.

From these comments and observations, it is evident that there are

many more similarities than differences in the actual organization of the reading programs in the schools of Manchester, England and those of Edmonton, Alberta. However several distinct differences with possible significance on the achievement ratings obtained in this study should be identified.

In England, children enter school at five years of age, and are given a prolonged pre-reading program. This program has much in common with the private kindergarten instruction that some Edmonton children receive, but it is more specifically directed toward developing the necessary pre-requisites to systematic reading instruction. The importance of this program is stressed in this statement from a Ministry of Education bulletin.

> The teacher's task is not merely to wait inertly until the child expresses readiness to read, but to do all she can to create . . . the felt need, and interest which encourages the child to make the effort. (12, p. 158)

After three to six months, Manchester children are started in the organized basic instructional reading program, and are usually expected to have experienced initial success in reading before the end of their first school year.

In Edmonton, children enter the first grade at approximately six years of age, and after two to six weeks of readiness instruction embark on the systematic basic reading program. Most Edmonton children have experienced initial reading success before the end of the first grade.

The role of parents in reading instruction seems to be much more clearly defined in Manchester than in Edmonton. Manchester children are

encouraged to take their books home each night, and to have their parents "hear" their reading. Edmonton teachers tend to follow the American point of view that "systematic instruction in reading should be left entirely to the school." (3, p. 156)

Writing is used as a basic part of reading instruction much more frequently in Manchester than in Edmonton. From the very beginning of their school careers, Manchester children are encouraged to keep a "diary" of important daily occurrences. Copy work is also an integral part of their reading program, and most teachers are convinced of its importance as a basic aid to instruction in reading. Correlation of written language with the reading program is deemed advisable among Edmonton teachers, and reading supervisors, but such correlation is not usually much in evidence until the third grade.

Head teachers who do not have responsibility for their own classrooms in all schools containing more than five classes in the Manchester educational system present a definite advantage to their reading program, which the Edmonton educational system lacks. The majority of these Manchester head teachers devote some of their time to the identification of children who are having special difficulties with the reading process, and to working with these children independently, and in small groups in order to remove these difficulties, and to improve their achievement in reading. Special remedial reading teachers also visit many of the schools regularly to work with the more difficult cases of reading retardation. A similar plan providing special help for children with severe reading difficulties has recently been set up by the Edmonton Public

School Board. However, principals in most elementary schools in Edmonton are usually occupied in teaching their own assigned class for a large section of the school day.

The influence of the "eleven plus" examination on the curriculum and teaching methods used in the English primary schools has already been mentioned. This influence is particularly relevant to the reading program, as success in this examination is partly dependent on achievement in silent reading. English schools are therefore more prone to concentrate on reading during the early school years to the neglect of the program in social studies and science.

Most of the basal readers used in the Manchester schools are published in England, although certain American series, notably the McKee Series (20) and the Ginn Series (30) are becoming increasingly popular. High import duties hinders their wider adoption. Hollinshead's observation that "American textbooks are the envy of the world" (13, p. 90) was confirmed by the writer's experiences in the Manchester schools. All of the basal readers used in the Edmonton schools at the present time are published in the United States, but there is strong pressure for the use of more textbooks in all subjects that are written and published by Canadians.

It can be fairly said that the differences in the teaching of reading in Manchester schools from the teaching of reading in Edmonton schools are relatively insignificant. An examination of the reading programs in both cities adds agreement to Bond's statement:

> There are more similarities than differences in reading instruction in the various English-speaking countries. (3, p. 154)

Gray (12) also observed that most of the problems faced in the teaching of reading and spelling in England are similar to our own.

CURRICULUM AND INSTRUCTION IN ARITHMETIC

Brownell (4) visited Britain in June, 1959 and made the following observations of instruction in lower grade arithmetic in English and Scottish schools. Brownell spent two weeks in visiting schools throughout the country.

> In Great Britain, children start school at age, five, and not at age, six or six and one-half (or later) as in this country (referring to the United States). On this account one cannot equate children in English and Scottish schools exactly grade by grade with American school children. Nor because of the earlier start of school instruction in Britain can one equate British children educationally age for age with American children. (4, p. 165)

In relation to curriculum and instruction, Brownell notes the following differences in the general arithmetic program of the British schools, and the schools on this continent.

1) More arithmetic is taught and it is taught faster in British schools.
2) British schools on the average devote fifty per cent more time each day to arithmetic than do our schools. (American schools devote about thirteen per cent of the school day to arithmetic. This percentage would be approximately correct for Edmonton schools too).
3) Arithmetic is given top priority among all subjects in the elementary curriculum in the British schools.
4) More specifically, the method for the process of subtraction most uniformly taught is "Equal Additions". Many English teachers are ignorant of the method of "Decomposition", which is much easier to objectify and rationalize. (The "Decomposition" method is uniform in Edmonton schools).
5) Outstanding is the wide variety of materials, methods and expected outcomes to be found in the different schools throughout Great Britain. This variety is more understandable when one grasps the full import of the great authority that is given to each school headmaster or headmistress. He or she is responsible for what is taught, and to a considerable extent, for

> how it is taught. (This opportunity for greater variety in all aspects of the British school curriculum has previously been discussed).

To Brownell's observations of the arithmetic programs in the British elementary schools, the writer from her own observations in schools of the Manchester area might add:

1. Very keen interest is currently being shown by teachers and school administrators in the newer approaches to the teaching of arithmetic. Special courses are being run by the Ministry of Education, and representatives selling Cuisenaire, Stern and other more recent materials for arithmetic teaching cannot meet the continual demands for their services. This interest seems particularly high in the Manchester area.
2. A much greater amount of time is devoted to drill on arithmetic fundamentals in the Manchester schools than in the schools of the city of Edmonton. This increased time is partly explained by the complexity of the English monetary system, the daily use of which requires considerable ability to do rapid mental calculations. Other more unusual measurements based on units other than the decimal system are used much more frequently in Britain than in Alberta, and therefore require increased emphasis and drill in the school program.
3. Many of the basic arithmetic processes are taught to children in Manchester at a younger, chronological age than to the children in Edmonton. Before the end of their second year in the Junior School (eight years of age), most Manchester children have mastered the four basic arithmetic processes including the more complex steps in

multiplication and division. Edmonton children are at least two years older when they reach this level of competence.

4. The teaching of "mental arithmetic" as distinct from other aspects of the subject is a common practice in Manchester schools. This teaching often takes the form of a ten-minute oral drill session at the beginning of each arithmetic lesson. Tests of this skill are always included in any of the formal arithmetic tests given throughout the school year. This ability to do fairly complicated arithmetic calculations rapidly without the use of a pencil is deemed to be a much more essential skill for children to acquire in Manchester than in Edmonton.
5. The opportunity for the more academic students in the Manchester Grammar Schools to specialize in Mathematics during their last two years at school makes it possible for the program that they receive to be at a much higher level of mathematical understanding than the Mathematics programs in the Edmonton High Schools.

CURRICULUM AND INSTRUCTION IN LANGUAGE

Again, variations in the instructional programs for the teaching of language can be observed in different parts of Great Britain. Generally oral and written language is given major emphasis in the school's program. A Ministry of Education bulletin on language included the following statement relative to oral language:

> Because of the language immaturities among five-year old children, the Infant School must give major consideration to language development, even to the virtual exclusion of reading and writing. (12, p. 158)

A variety of accents and colloquial expressions in different parts of the country increase the importance of the oral language program in the schools. The writer's observations in the schools of the Manchester System appear to indicate that greater effort is devoted to developing habits of correct speaking than is true in the Edmonton schools. In addition to the emphasis on speech by all classroom teachers, a number of speech therapists are employed by the Manchester Education Committee to give help to those children having particular speech difficulties. No such special help is available in the Edmonton School System.

Written language receives daily attention in the Manchester elementary classrooms through the "daily diary" that has previously been mentioned in connection with the reading program. The writing of an essay or "script" is an important part of the "eleven plus" examination with the result that written language receives increased attention in the later years of the primary school program. This emphasis continues in the "English" program of the Manchester secondary schools. Concentrated attention to children's written language in Edmonton is usually left to the latter part of their elementary school program. Again colloquial expressions may make the school's job in written language a more difficult one in Manchester than in Edmonton.

The type of language learnings that are assessed in this study (objective test items on language rules) appears in the language instructional programs of both cities, but Edmonton children may be more familiar with the actual type of exercises used.

Spelling appears to create particular difficulties for some

Manchester children too. The children's pronunciation of some words is so non-phonetic that many words which children in Edmonton can spell through the application of specific generalizations must be studied in isolation by their Manchester counterparts. The teaching of phonics as an aid to both reading and spelling is a much more complex job in Manchester than in Edmonton.

Statements in connection with the reading programs in both cities have indicated the greater number of similarities than differences in the two programs. These statements are also applicable to the curriculum and instruction in language in both cities.

RELATED STUDIES

It is only very recently that studies of the comparative achievements of educational systems in different countries, and in different parts of the world have come to the fore. Bodoh, writing recently in _Educational Leadership_ stated that:

> There has been more reference to the relative merits of European and American education in the past five years than in the previous fifty years. (2, p. 459)

The increasing interdependence of nations partly explains this increased interest, and the effect of recent scientific and technological advances on comparative education research has already been mentioned. The exchanges of students and teachers leading to exchanges in ideas and methods have also become a very common occurrence in recent years.

Our recent increased interest in schools abroad is also generated from the continuing discussions of the future of education in our own

country. The educational programs of other lands become of increasing significance to us as we attempt to improve our own educational program. All countries can find something to learn from the educational experiences of other countries. It is certainly true that:

> An extension of our knowledge about education elsewhere will give us a clearer idea of the role we want for our schools, and an enlarged capacity for making discriminating judgments regarding difficult problems in education. (26, p. 243)

Currently UNESCO is adding increased knowledge in the field of comparative education by undertaking a large educational testing program involving several of the U.N. member nations in an attempt to compare the standards of educational achievement in the nations concerned. The first reports of the results of this study will not be available until late in 1964.

No previous comparative study of the educational achievements of selected groups of children from the two nations compared in this study has been located in the literature. However a number of similar studies have compared European educational achievements, particularly British with those in other geographical regions of this continent. The results of the majority of these studies have tended to indicate that the proposition that educational achievement for the majority of the school population in European countries exceeds that of the school population on this continent is open to serious questioning, and that there is a need for a great deal of research in this area.

A number of these comparative studies are briefly reviewed here.

Reading:

Scholl (32) used the Stanford Achievement Tests--Form J (Paragraph Meaning, Word Meaning and Spelling Sub-tests) with a systematic sample of children enrolled in the schools of Burton-upon-Trent, Staffordshire, England. Children were chosen from the second year of the Infant School (age 7), the second year of the Junior School (age 9), the fourth year of the Junior School (age 11) and the second year of the Secondary School (age 13). In order to make some provision for the difficulty that English children might have with the "American English" used on the test form, an adapted form (substitution of single words where meanings or spelling differed, e.g. lorry--truck, aeroplane--airplane) was given to one-half of the subjects at each age level. No significant differences on the test scores of children taking the adapted form, and those taking the original form were revealed. Scholl's results are therefore based on the test scores of those children taking the original form of the test. Those mean scores, which were significantly different in the English sample from the American norms for each of the sub-tests are listed here.

Paragraph Meaning:
  Age 7: Mean score for the English children was above the American norms.
  Ages 9, 11: Mean scores for the English children were below the American norms.

Word Meaning:
  Ages 7, 13: Mean scores for the English children were higher than the American norms.

Spelling:
  Age 7: Mean score for the English children was higher than the American norms.

Scholl's main conclusion from these results is that:

> No convincing evidence was obtained that Burton children derive

> a significant benefit from being introduced to reading at ages five and six, rather than being introduced to reading between ages six and seven. (32, p. 108)

Other factors, which may be operating in addition to the difference in beginning school age for the two countries are not discussed in Scholl's report. Such factors as differences in materials, methods, time allotment, etc. should also be considered. The major statistical weakness in this study is that test scores obtained by children in a very limited area of Great Britain were compared with the norms for an American test that were obtained from a sample testing of children throughout the nation. There is no guarantee that the mean scores for children in any particular city of this continent would be identical to the country-wide norms. Scholl would have gained further evidence, on which to base her conclusions if she had also tested children in a particular city area on this continent, and compared these obtained scores for urban children in the United States with those of the Burton children, rather than using the general norms for the test, which are based on combined rural and urban samples of children in the United States.

Scholl (32) is currently working with Anderson at the University of Michigan on a further comparative study of the reading, writing and spelling achievement of a group of English and Scottish children with American children. The final results of this study will not be available until later this year. Their investigation is limited to children of seven, eleven and fourteen years of age in the schools of the West Lothian County of Scotland, the Leeds city area in England, and schools in several Michigan communities in the United States. The testing program includes

tests of reading comprehension, reading vocabulary, spelling, quality of handwriting, and oral reading.

Preston (24) from the University of Pennsylvania reported on the results of one of his comparative studies of the reading achievement of German and American children at the 1961 Conference of the International Reading Association. Preston used two reading comprehension tests (*The Frankfurter Test* prepared for use in German schools, and standardized in Germany, and the comprehension sub-test of the *Gates Reading Survey*) with fourth and sixth grade pupils in Wiesbaden, Germany and Philadelphia, U.S.A. in order to test the widely accepted proposition that:

> Reading is more effectively taught in Europe than in the United States. (24, p. 109)

No details are given relative to the methods used in translating the *Frankfurter Test* into English, or the *Gates Reading Survey* into the German language.

The major findings of his study are listed here.

(a) In reading comprehension, the mean scores of the American subjects in all but one of the four sub-groups were higher than those of the corresponding German pupils. These differences were significant in half of the comparisons, favouring the American subjects. The single exception was sixth grade German boys, whose mean was significantly higher than their American counterparts on both of the comprehension tests.

(b) The mean scores for speed of reading were significantly higher for all American sub-groups than for the corresponding German sub-groups. (This score was obtained by interrupting the administration of the *Gates Reading Survey* ten minutes after the signal to begin, and having the subjects encircle the number of the paragraph they were then reading. It is therefore questionable if this method gives a valid measure of speed of reading, and particularly whether it is a fair measure of speed of reading for the German children).

(c) Differences in incidence of reading retardation (scores below

the tenth percentile) between German and American subjects were unpatterned and negligible.

(d) The mean scores for American girls significantly exceeded those of the American boys. With reference to the German sample, the reverse tended to be the case. These trends were also found in an examination of the incidence of reading retardation between the sexes.

Preston concludes that:

> The data of this study do not support unqualified statements that German children read better than American children, or that the incidence of reading retardation is greater in the United States than in Germany. Furthermore the often mentioned thesis that European education is superior to American education is of doubtful validity. (24, p. 111)

Preston (23) has also completed an earlier comparative study in reading, in which he attempted to identify reasons for the strikingly high degree of success achieved by German pupils in learning word recognition. Those reasons that he identified include:

(a) The German language is a more phonetic language than English, and has more consistent accent principles.
(b) There are fewer words of foreign origin in the German language, than in English; hence word meanings are not such a difficult problem.
(c) The German language has a fewer number of total words than the English language.
(d) A greater emphasis is placed on oral reading in German schools.
(e) German school children often stay with the same teacher for three or four years, and very few pupils are failed in their first year at school.

Preston (24) is also currently working on a further comparative reading survey in German and American schools. The results of this study will not be available until later this year.

The comparative reading research study of most significance to the present study was completed at the University of Alberta in 1961 by Foster (11). Foster made a comparative study of the reading achievement

of children in Christchurch, New Zealand with children in Edmonton, Alberta. Her sample included five hundred children from the Edmonton grade six population, two hundred and fifty children from the Christchurch Standard Four classrooms, and three hundred children from the Christchurch Form One population. The children in Standard Four in Christchurch have attended school for the same number of years as grade six children in Edmonton. Children in Form One in Christchurch are of approximately the same chronological age as grade six children in Edmonton. The tests used for the Edmonton--Christchurch comparison were the California Short-Form Test of Mental Maturity, the Otis Quick-Scoring Mental Ability Test -- Beta Form, the reading section of the California Achievement Test Battery, Elementary Form, and three Australian reading tests (word knowledge, speed of reading, reading for meaning) that have been standardized for use in New Zealand. A brief summary of the findings of this study follows.

(a) Intelligence: The intelligence quotient mean score of the Edmonton grade six pupils was greater than that of the Christchurch Form I, or that of the Christchurch Standard IV pupils. (As both of the intelligence tests used in this comparison were published and standardized on this continent, cultural influences may well have favoured the Edmonton pupils).

(b) Reading Vocabulary: There was no significant difference between the mean score of the Edmonton grade six pupils, and that of the Christchurch Form I pupils on the Word Knowledge section of the Australian reading test. The mean scores for both groups were significantly higher than that of the Christchurch Standard IV pupils. On the reading vocabulary section of the California Reading Test, the mean score of the Edmonton grade six pupils was significantly higher than either of the New Zealand groups.

(c) Speed of Reading: The mean score for the Australian Speed of Reading Test was significantly higher for the Christchurch Form I pupils than for the Edmonton grade six pupils. There was no significant difference between the mean scores on this

same test for the Christchurch Standard IV children, and the Edmonton grade six children. (As this test was standardized in New Zealand, there is a possibility that cultural factors may have favoured the New Zealand children. Words such as "cornfield, sweets, homestead" may have slowed the speed of reading of the Edmonton children).

(d) Reading Comprehension: The mean scores for the Edmonton group on both the Australian Reading for Meaning Sub-test, and the comprehension sub-test of the California Reading Test were significantly higher than the mean scores of either of the New Zealand groups on either of the comprehension tests. Significant differences in the same direction were also found for the total reading scores (reading vocabulary and reading comprehension) on the California Reading Test.

Foster concludes from these results that:

> The one-year earlier starting age of New Zealand school children, as compared to the Alberta starting age, does not prove to be an advantage in the acquisition of skill in reading vocabulary or reading comprehension as tested in this experiment. (11, p. 58)

There is no indication that initial differences in the intelligence test scores for the two selected national groups were considered when the achievement scores for the two groups were compared.

A different type of comparative research study in reading was completed by Russell (29) in 1956 in the Infant and Junior Schools of England and Scotland. Russell, from Stanford University in the United States visited fifty classrooms containing children from five to nine years of age in London, Bristol and Edinburgh, and made detailed notes of all aspects of the reading program that he observed. He was particularly interested in those aspects of the program that differed from those in the United States. He also interviewed twenty head teachers, and held discussions with State Inspectors of Schools, persons working in research in reading, and Instructors in Teachers' Training Colleges. In addition, he made a brief analysis of published circulars on reading, and of three

sets of widely-used readers.

From the results of this investigation, Russell reports that:

(a) British teachers are relatively uninfluenced by published requirements of an education authority, or by suggestions given in teachers' manuals that accompany reading textbook materials.
(b) A consistent attempt is made to allow children to work by themselves at their own speed. There is much less emphasis on group instruction in readiness, and early "look and say" activities.
(c) Phonics are often not introduced until the second or third year of the child's school attendance. There is little evidence that any one system of successive steps in phonic skills is being taught.
(d) Special remedial groups for reading instruction for children from eight to eleven years of age are common in many schools.
(e) Surveys of the reading achievements of British children show steady improvement since the end of World War II. (29, p. 447)

The following strengths of the reading programs in British schools as compared to those on this continent were identified by Russell's investigation.

(a) British teachers recognize that reading is an important part, but only one part of the child's total development.
(b) A widespread effort is made to help children on an individual basis.
(c) A wide variety of materials to aid growth in reading are available.
(d) Extensive use of writing as an aid to growth in reading is evident.
(e) Many attempts to tie reading to the other language arts can be noted.

The following weaknesses of the reading programs in British schools as compared to those on this continent, with which Russell is more familiar were also identified.

(a) Aimless oral reading can be observed in most schools.
(b) There seems to be a lack of preparation for attacking difficulties in reading, and of enough guidance in avoiding errors. Russell did not once observe a reading lesson, in which the new words were introduced before the children opened their books.
(c) There seems to be a lack of planning for small-group activities in the reading program.

(d) No definite attempt to bring book-reading abilities, and phonic skills together is observable.
(e) There is a lack of in-service programs for teachers of reading.
(f) Large classes (e.g. forty children in one Infant or Junior classroom) are quite common.

Russell's structured observations provide research information that is equally as important in comparative education as objective testing programs similar to this current study.

Further evidence relative to the question of how English school children compare with school children on this continent was obtained from observations of the English children, who were evacuees in Canada during World War II. When interpreting these observations one must remain cognizant of the stress under which most of these children were working, and the very abnormal conditions (complete separation from their homes, families and their countries) under which these observations were made. General reports from their temporary teachers, when they were questioned by The School (elementary edition) (22) indicated that:

(a) Most of the children felt at home in Canada, enjoyed themselves, mixed well with Canadian children and took part in after-school activities.
(b) The same variation in standards of school attainment was present among the English children as among the Canadian children.
(c) The English children tended to show a certain kind of precision and care in their school activities that is often lacking in Canadian children. However, they often seemed to show a lack of exact knowledge, and their foundation work particularly in mathematics seemed less adequate than that of the Canadian children.
(d) The English children seemed to have a larger vocabulary, more reading experience and the ability to express themselves more succinctly than most Canadian children of the same chronological age.
(e) The English children as a group appeared to lack natural freedom, and to have a feeling that all teachers are only mistresses to be obeyed. They showed little willingness

to express their feelings, and made fewer demands on the class teacher than most of the Canadian children.

(f) Generally speaking, the school achievement of the English evacuee children seemed to be on a par with their Canadian counterparts. Their main strength was in English; their weakness was in Mathematics.

The teachers concerned had previously taught Canadian children only.

The results of all comparative research in reading that has been located in the current literature indicate the need for a great increase in the number of comparative research studies before definite statements can be made about the superiority of the educational system in one country over another. It can fairly be said that standards of achievement in reading in most countries, particularly in Great Britain and Canada have shown marked increase since the end of World War II.

Arithmetic:

Comparative research in certain aspects of the arithmetic program is relatively easier than in the field of reading because of the common use of the Hindu-arabic number system. However the use of various monetary and measurement systems in different countries, and the problem of creating arithmetic problems that are relatively free from cultural influences create difficulties for the comparative researcher in this subject too. As in the field of reading, a great increase in comparative research in arithmetic has become obvious in recent years.

One of the first major studies was done by Buswell (7) who completed a comparative study of achievement in arithmetic in England and in Central California in 1957. The examination used was based on the English

"eleven plus" examination with adaptations to eliminate those items employing peculiarly English arithmetic skills, such as money conversions. Section I was made up of numerical items, and Section II was composed of word problems. The study compared sizable samples of randomly selected children between ten years, eight months and eleven years, seven months in both countries.

> Because of the differences in school organization in England and the United States, a more valid comparison can be made by keeping the age-range constant than by trying to compare corresponding school grades . . . Differences in promotion rates, school organization, placement of curriculum materials and such factors naturally vary from country to country. (7, p. 3)

Buswell emphasized in the report of his study that his results were simply a body of facts, which must be interpreted in terms of the total philosophy, and the objectives of education in the two countries studied.

> The factual results of the study make it clear that pupils at age eleven in English schools are markedly superior to pupils of the same age in California in arithmetic achievement as measured by this test. (7, p. 5)

The mean score of the English sub-sample (29.1) on this test was more than double that of the mean score of the California sub-sample (12.1). There were also great differences in the standard deviation of the scores for the two groups. The standard deviation of the English sub-sample was significantly higher, indicating a wider range in the arithmetic achievement of the English children.

Buswell followed up his study by an examination of the arithmetic textbook materials found in both countries. This analysis revealed that most arithmetic concepts are taught to English children who are one to

two years younger than the age level, at which these same concepts are taught to American children in California.

In attempting to explain the marked difference in the mean scores for the two sub-samples, the author states that:

(a) There is no reason why the schools in both countries should be alike.
(b) The mobility rate of the California population is extremely high.
(c) The age of school entry differs in the two countries.
(d) The preparation of teachers differs in the two countries. (Buswell infers that English teachers have a better background in arithmetic).
(e) Children in California continue to study arithmetic until the age of fourteen years. Most English children complete their arithmetic study at the age of eleven years.

Buswell further indicates that the finding of his study, which should cause the most concern to educators on this continent is our failure to produce pupils of very high arithmetic accomplishment. Scores of the top third of the English sub-sample (1,077 children) were equalled by only thirteen of the California children.

A follow-up to Buswell's study was completed by Tracy (40) at the University of Carolina in 1959. Tracy added data from children of the same chronological age in North Carolina to Buswell's data, and did a three-way comparison.

Since arithmetic training in England is normally completed at the end of the sixth year of elementary education, and terminal training in arithmetic in the United States is normally completed at the end of the eighth year of elementary training, Tracy also compared eighth-grade achievement in arithmetic in selected North Carolina schools with sixth-grade achievement in arithmetic (the last year in the Junior School) in

selected English schools. He used the examination developed by Buswell.

For the children of chronological ages, ten and eleven years, the North Carolina group scored significantly higher than the California group, although still significantly lower than the English group. It should be noted that the North Carolina data was collected in 1959, and compared with the California and English data that had been collected two years earlier.

For the children in the sixth year of their elementary training in England, compared with those children in the eighth year of their elementary training in North Carolina, the results indicated that:

(a) There was no significant difference in the mean total test score for the two groups.
(b) The North Carolina distribution more nearly approached a normal distribution curve, being less positively-skewed than the English distribution.
(c) The North Carolina group was significantly below the English group on the numerical items making up the first section of the examination. (This section involved a considerable number of problems in which denominate numbers and conversions were employed).
(d) The North Carolina group was significantly better than the English group on Section II (Word problems involving reading ability and concept mastery) of the examination. The North Carolina ten and eleven year olds did nearly as well as the English group on this section of the test.

Tracy concludes from these findings that:

> American schools are taking two extra years in which to assure achievement levels equivalent to those attained in English schools. (40, p. 202)

It should be noted that the test used was English in origin, and that the problems are therefore oriented to the needs of the English society. Tracy notes that:

> No single examination unless specifically devised to test

> equated groups by use of culture-free items can be expected to give accurate results and permit valid comparisons. (40, p. 202)

A further comparative arithmetic research study was completed by Kramer (17) in 1959. Kramer compared the arithmetic achievement of 1,511 Dutch children in forty fifth and sixth grade classes with 1,530 Iowa pupils in grades five, six, seven and eight. For his testing instrument, Kramer used a modified American test. He eliminated those items dealing with units of measure that differed in the two countries, those items involving articles with prices that were not comparable in the two countries, those items with a unique American background, and those items involving abbreviations that were more common or easier to understand in one country than another. Kramer also provided a practice test for the Dutch children in order to familiarize these pupils with multiple-response items, and methods of marking answer sheets.

The results of this study indicated that the children in the Netherlands were superior on both sub-tests (ability to solve problems, and the ability to understand concepts and processes in arithmetic). The average performance of the sixth grade children in the Netherlands was higher than the Iowa average in the eighth grade.

Kramer partly explains these significant differences in terms of the marked differences in the Dutch elementary school arithmetic program from that of the Iowa elementary schools. The time allotment for arithmetic in Dutch elementary schools is greater than in the Iowa program, and therefore the grade placement of concepts and processes in arithmetic in the Dutch elementary schools is approximately one year ahead of the placement in the Iowa schools.

Differences in the philosophy and aims of the two educational systems may play a major part in this significant difference in arithmetic achievement in the two countries, but another major factor is that the failure rate in Dutch elementary schools is more than twice as high as that in the Iowa elementary schools. Therefore if a child does not achieve in arithmetic in Dutch schools, there is more likelihood that he will not be in the sixth grade of the elementary school than if he were in the Iowa school system.

There is also additional need for more comparative studies relative to achievement in arithmetic in various countries before definite statements about the superiority of any program can be made. However the case for the superiority of European school children over children on this continent in knowledge of the fundamentals of arithmetic is quite definitely made. The question of relative achievement in arithmetic reasoning skills, and the understanding of basic arithmetical concepts and processes needs additional investigation.

Language:

No comparative studies of competency in language skills in selected national groups have been located in the literature.

The major reason for this dearth of research in the language area would appear to be the more serious difficulties presented in the planning of comparative research studies in this area than in the other subject-matter areas. There are so many aspects of the language area (speech, listening, spelling, different types of written language including creative writing, and quality of handwriting) that need investigation,

and many of our measures of these skills on this continent are still in need of definite validation and standardization.

Attempts to compare achievement in any of the language skills in different countries would be presented with the difficulty of identifying suitable measures of these skills, if such measures exist, and furthermore might find it almost impossible to identify definite programs for the teaching of the language skills in the schools concerned.

Comparisons in countries with different basic national languages present additional difficulties, but even comparisons in two English-speaking countries present difficulties due to differences in sentence structure, colloquial expressions, the spelling of particular words, and varying accents and pronunciations.

Because of the importance of language learnings to achievement in all subjects of the school curriculum, particularly to reading, comparative studies in this field are most desirable. A comparison of the ability of students in two selected countries to express their ideas in clear and concise written English would be a most useful research study.

SUMMARY

It has been indicated throughout this review of completed comparative research concerned with achievement in the three basic subject areas that material of this nature is scarce. All relevant comparative studies found in the literature have been included in this chapter in spite of the many limitations, which might well affect the results and conclusions in many of these studies.

Methods of sampling, and the validity of the chosen testing instruments for children in both sub-samples are the greatest weaknesses identified.

However, all comparative research studies that have been completed represent only a beginning in this rapidly expanding field. The results of these studies, if not acceptable without careful questioning can be used as the basis for the formulation of testable hypotheses leading to further more comprehensive research in comparative studies of educational achievement. Such exploratory studies must always make up the beginnings of research in any area. Significant trends are beginning to be indicated in the fields of reading and arithmetic. Additional and varying types of comparisons are needed to confirm these trends and to identify specific reasons for them.

CHAPTER III

THE EXPERIMENTAL DESIGN

The two cities selected for this experiment do not have identical time division of the school year. Arrangements for the administration of all the tests in both cities were made by the writer. Testing dates in the two cities were therefore not identical. The Manchester children were tested during the months of June and July, 1962. The Edmonton children completed the tests during the months of September and October of the same year. These testing arrangements made it possible to test the children in both cities during their fourth and ninth years in school respectively. However, the Edmonton children were just beginning their fourth and ninth years at school: the Manchester children were very near the completion of their fourth and ninth years at school, but both groups were of comparable chronological age.

This chapter will discuss the methods of selecting the samples in each city, the nature of the testing instruments, the reasons for the choice of these particular tests, the testing procedure, and the methods of analyzing the test data.

SELECTION OF SAMPLE

Approximately two hundred children at each age level (nine years and fourteen years) in each city were tested in this study. The schools (four in each city) were selected on the recommendations of education authorities in both cities as being representative of the total school

population of the chosen age-groups in each city.

The average enrolment in the thirteen Manchester classrooms was thirty-one children. The average enrolment in the fourteen Edmonton classrooms was twenty-six children.

Children from homes of all levels of socio-economic status were included in the sub-samples in both cities.

A proportionate number of children from an English Grammar School were included in the fourteen-year old group for the Manchester sample.

No children from special schools, or classes for the educationally retarded or the physically handicapped were included in either of the sub-samples.

Only those children who had completed all the tests were retained in the sample. In addition, eight children were discarded from the Edmonton nine-year old sample, and three children from the Edmonton fourteen-year old sample in order to equate the number in the sub-groups for each city. The eleven children eliminated were those with high intelligence test scores on the California Short-Form Test of Mental Maturity, in an attempt to decrease the difference between the mean intelligence quotient scores for the two sub-groups in each city. No significant differences existed between the total intelligence quotient scores for any of the four sub-groups when these eleven cases were discarded.

THE TESTING INSTRUMENTS

In order to reduce the possibility that children in either city would be more familiar with the tests used in this study, both English

and American tests were used in the testing program.

The tests that were used were:

Nine-year old group:

English Tests:

(a) Schonell Graded Word Spelling Test--Form A
(b) Watts Sentence Reading Test

American Tests:

(a) California Short-Form Test of Mental Maturity--Elementary--Form S
(b) California Achievement Tests--Complete Battery--(reading, arithmetic, language)--Form W--Elementary Level.

Fourteen-year old group:

English Tests:

(a) Schonell Graded Word Spelling Test--Form A
(b) Vernon Sentence Reading Test

American Tests:

(a) California Short-Form Test of Mental Maturity--Elementary--Form S
(b) California Achievement Tests--Complete Battery--(reading, arithmetic, language)--Form W--Junior High Level

DESCRIPTION OF THE TESTS

The Schonell Graded Word Spelling Test--Form A:

This attainment test in spelling is a group test, suitable for children in the age range of five to fifteen years. It is made up of one hundred words of increasing difficulty, which are dictated to the children until they fail with ten consecutive words.

The first five words listed on the test are:

"net can fun top rag"

The final five words at the end of the test are:

> "definite guarantee anniversary
> paraffin accommodate"

Many of the words on the test are regular in structure, and yield an estimate of the testee's power of sound analysis and auditory recall in addition to a general standardized spelling age.

No data is given on the construction of the test, reliability or methods of standardization in the test manual. However, Nisbet (6), Lecturer in Education at the University of Aberdeen acquired the following information relative to the background of the publication of the test through personal communications with the author.

> This test is composed of one hundred words, arranged in groups of ten words. The first group of words is the expected attainment of children of five and six years of age, the next group for children of six and seven years of age, and so on up to ages, fourteen and fifteen. The administration is oral, subjects writing the words on a blank sheet of paper as the tester first reads out the word, then the word embedded in an explanatory sentence, and finally the word repeated. It is left to the tester to invent explanatory sentences. Skill in inventing these sentences may affect the scores.
>
> A pool of words drawn mainly from the author's Essential Spelling List (34) was given to approximately two thousand English children, about two hundred in each age group from five to fifteen years. After the elimination of words, which were unsuitable in terms of statistical criteria, ten words were chosen for each age group, each word having been spelled correctly by forty-five per cent to fifty-five per cent of the age group. The last twenty words include more difficult words to allow headroom for the ablest children. (e.g. 'miscellaneous' and 'hydraulic')
>
> Reliability based on the test-re-test of one hundred and ninety-five children (age unspecified) is .96. (6, p. 370)
>
> Nisbet concludes from this unpublished information that:
>
> The representativeness of the standardization group is uncertain. The nature of the construction of the test complicates any

> revision of the test norms with changing standards. Nevertheless the list provides a convenient rough check on spelling attainment and is widely used for this purpose in Britain. (6, p. 370)

Although this test was published and standardized in England, it has been used frequently in Canada. It tests each student's ability to recall the correct spelling of each word, rather than merely to recognize the correct spelling of a word.

The Watts Sentence Reading Test:

This sentence reading test has been standardized in England for all children between the ages seven years, six months and eleven years, one month. It is made up of thirty-five multiple-choice test items, and assesses the ability of the child to read and understand incomplete sentences and to choose the correct completion word from the five words supplied.

The time allotment for the total test is fifteen minutes.

The items become increasingly more difficult as the subject proceeds through the test, and no credit is given for correct items after five consecutive items have been failed. This increasing difficulty is illustrated by the first, and the thirty-fifth test items.

1. Come with me to the shops to buy some (fire, water, stone, sweets, motors).
35. The political dangers of monopoly seem to have been much (exasperated, excised, exaggerated, expropriated, expostulated).

The reliability of this test is high, varying from .91 to .97 at different age levels. This reliability was calculated through the test-re-test of two hundred and forty-three children using the same test form with a one-week interval between the two testing times.

Raw scores on this test are converted to standardized scores through the use of a conversion table given in the test manual.

> By means of this table, we can find a child's standardized score for his raw score and age. The standardized scores are so arranged that they have a mean of one hundred, and a standard deviation of fifteen. These scores are similar to Intelligence Quotients in their numerical distribution, but they differ in that they are not arrived at through consideration of mental age. Each child is assessed by comparing him with a representative sample of children of exactly the same chronological age. (42, p. 2)

The scores of 7,776 children (3,987 boys and 3,789 girls) were used for the compilation of the conversion table of the raw scores to standardized scores.

Two brief reviews of this test, which was first published in 1956 are given in the Fifth Mental Measurements Yearbook. (6)

Dale, Lecurer in Education at the University College of Swansea concludes that:

> The test will prove to be a valuable means of assessing the comparative silent reading standards of individuals and groups. (6, p. 748)

Wiseman, Director of the School of Education at the University of Manchester criticizes the author for not giving more specific details about the drawing of the sample from British primary schools, and particularly about the regions from which it came. He also states that:

> A longer time interval should have elapsed before the test-re-test reliability was established. (6, p. 749)

Wiseman quotes his findings from one small group at three age levels, in which a one-year interval was allowed between the test-re-test sessions. The reliability coefficients were then lowered to .82 for the seven-year old group, to .89 for the eight-year old group, and to .88 for

[illegible]

> [illegible]

[illegible]

> [illegible]

[illegible]

> [illegible]

[illegible]

the nine-year old group for this same test.

Specific words on this test, which might have caused difficulty to the Canadian children are "sweets, engine driver, guard, chemist." Many of the sentences in the test also assume certain experiences that English children will have had, but these experiences are not so typical for Canadian children. Item 5 on the test is an example:

> I should like a holiday at the seaside, where I could play in the (lake, sand, road, river, hills).

This test is one of the few standardized reading comprehension tests available in England for this age level at the present time. Its major limitation is that many types of reading comprehension skills are not tested.

The Vernon Sentence Reading Test:

This sentence reading test has been devised for use with brighter ten-year olds, eleven-year olds, and older children. Its format is similar to that of the Watts Sentence Reading Test, and it attempts to test the same type of reading skill at a higher age level.

The test is made up of forty-two multiple-choice test items of increasing difficulty. Slight correction is made for guessing in the scoring of the test.

The child is allowed fifteen minutes to complete as many of the test items as possible.

Items, number one, and forty-two are listed here.

1. Ducks swim in a (bucket, pond, yard, cage, garden).
42. To identify any form of government with Christianity is a dangerous error, for it confounds the permanent with the

> transitory, the (good, temporary, real, absolute, religious) with the contingent.

Vernon (41, p. 96) maintains that this shorter type of reading comprehension test can give as equally high reliability as the longer paragraph reading tests, which are so common on the North American continent.

This test is very widely used in the British Secondary Schools. Raw scores may be converted to a reading age, or to percentile scores based on the total population, or to percentile scores based on the Grammar School and University population only. Specific information relative to the actual population, and methods used in standardizing this test are not available. The population used in the standardization was completely an English one.

This comment by Nisbet (6), University of Glasgow in reference to Vernon's arithmetic test is equally applicable to the author's reading test.

> Its very wide attainment range makes it a useful general purpose instrument for survey work, though it will not give fine discrimination at any particular level. (6, p. 599)

Examples of words on the test, which may have caused difficulty for the Canadian fourteen-year old children are: 'flat', 'headmaster', and 'eye wash'.

Again the major reason for the use of this test in this experiment is that it is one of a very small number of reading comprehension tests standardized in England for this age level. The major limitation for its use is the lack of a test manual giving a clear concise description of

its construction, standardization and procedures for interpretation. It is one of the few tests of reading that are available for testing programs of this nature because a number of the superior tests are reserved by the Ministry of Education for their own testing purposes.

The California Achievement Tests: Complete Battery
(a) Grades 4-5-6 Form W. Elementary Level
(b) Grades 7-8-9 Form W. Junior High Level

> The California Achievement Tests are a series of comprehensive tests designed for the three-fold purpose of facilitating evaluation, educational measurement, and diagnosis. (37, p. 5)

The complete battery is composed of three tests: Reading, Arithmetic and Language. These three tests are further divided into two parts each: The Reading Test consists of Reading Vocabulary and Reading Comprehension; the Arithmetic Test consists of Arithmetic Reasoning and Arithmetic Fundamentals; and the Language Test consists of Mechanics of English and Spelling.

Reading Vocabulary--Test 1: This test consists of fifty items at the Elementary Level, and sixty items at the Junior High Level. It is divided into four sub-tests designed to measure vocabulary in four separate areas of the school curriculum, namely mathematics, science, social science and general vocabulary. Some items on this sub-test may have been of less difficulty for the Edmonton children than for the Manchester children. Item 5 in the Elementary form of the test is an example.

> Mark as you are told the number of the word that means the opposite or about the opposite of the first word.
> sum 1. chief 2. difference 3. vessel 4. spot

The word, sum, which is used exclusively on this continent in

connection with the process of addition (and hence its opposite required for the test answer would be difference) is used in Britain to refer to mathematical calculations involving any of the four basic operations. Words, such as "divisor" and "quotient" do not hold the same integral place in the mathematics curriculum in Manchester as they do in Edmonton.

Reading Comprehension--Test 2: This test, designed to reveal the pupil's comprehension of what he reads includes sub-tests measuring the pupil's ability to follow directions, to use reference skills, and to make valid interpretations of what is read. Seventy items on a wide variety of topics are included in the Elementary form. The Junior High School Form includes eighty-six items designed to measure similar basic reading comprehension skills.

Arithmetic Reasoning--Test 3: Both forms of this test contain three sections. The form for grades four, five and six contain forty-five items on arithmetic meanings, signs and symbols, and problems. The form for grades seven, eight and nine contains forty-five items on arithmetic meanings, symbols, rules and equations and problems. Five of the items on the Elementary Form, and eight of the items on the Junior High Form involve the use of dollars and cents.

> The object of this test is to provide mathematics items, which will quickly reveal the degree of functional ability rather than to include long and involved problems in the solution of which differences in attention span and memory may operate as disturbing factors. (38, p. 6)

Arithmetic Fundamentals--Test 4:

> The Arithmetic Fundamentals Test is divided into sections on addition, subtraction, multiplication and division, each sampling the different essential elements of its particular function. (38, p. 6)

There are twenty items in each of the sub-sections on each of the forms of the test. Only four of the eighty items, on each of the forms involve the use of dollars and cents, and the examinee is only required to recognize the correct answer rather than to reproduce it for himself.

Mechanics of English--Test 5:

> Test five consists of three sections--Capitalization, Punctuation and Word Usage. These three sections sample twenty (twenty-two at the Junior High Level) different essential elements of the mechanics of English and provide an aid in diagnosing the specific difficulties encountered by pupils in this area. (37, p. 7)

There are ninety-nine test items on the Elementary form of the test, and one hundred and six test items on the form for Junior High School pupils.

Spelling--Test 6:

> Thirty carefully selected sets of four words each are used. The pupil must decide, which, if any of the four is misspelled in each set. Spelling is included in Language because of its use as a means of written expression. (37, p. 7)

The one hundred and twenty words included on each form of the test are based on words common to the spelling vocabulary of children on this continent at the designated grade levels. There is less likelihood that they will be common in the spelling vocabulary of the Manchester children at the comparable age levels. Words such as timber, mileage, cement, lantern and prairie have a much closer relation to patterns of life in the Edmonton area than in the Manchester area.

Statistical measures of high reliability and validity must play a large part in the evaluation of any test.

The average coefficient of reliability for the six sub-tests

(calculated by the Kuder-Richardson Formula 21) is .97 for the Elementary form of the test and .98 for the Junior High form.

The coefficients of reliability for the scores on the six sub-tests that were used in this experiment are reported in the following table. These reliability coefficients were also calculated by the Kuder-Richardson Formula 21.

TABLE I

COEFFICIENTS OF RELIABILITY FOR THE SIX SUB-TESTS OF THE CALIFORNIA ACHIEVEMENT TEST BATTERY

Sub-test	Elementary Form	Junior High Form
Reading Vocabulary	.91	.90
Reading Comprehension	.91	.92
Total Reading	.95	.95
Arithmetic Reasoning	.79	.84
Arithmetic Fundamentals	.70	.93
Total Arithmetic	.86	.94
Mechanics of English	.94	.92
Spelling	.81	.83
Total Language	.92	.93

The tests are claimed by the authors to have high content validity, measuring many of the most universal subject-matter objectives of the curriculum.

> Curricula in science and social studies may differ widely in different school systems; but the basic skills or tools of learning are relatively similar in all schools. Consequently irrespective of the school, test scores on this battery will show the extent of pupil mastery of the fundamental skills in terms of grade placements and percentiles based upon a carefully sampled national population. (37, p. 8)

High construct validity is also claimed by the authors for the tests. The strong, positive correlation between school achievement and intelligence that has long been evident is maintained on these tests. A strong positive relationship with other educational instruments measuring school achievement is also maintained. Validity coefficients based on these comparisons are above .70 for all sub-tests.

In his review of the tests in the Fourth Mental Measurements Yearbook, Flanagen (5), University of Pittsburgh states that:

> More objective and specific information about the extent, to which students might profit from additional time would be desirable in the manual. (5, p. 568)

He concludes by stating that:

> Although the test user might wish for somewhat more precise technical information regarding the test, it is this reviewer's opinion that he will find the California Achievement Tests a valuable tool in appraising the progress of pupils. (5, p. 569)

Neidt (6) Professor of Educational Psychology at the University of Nebraska also reviewed the complete battery (1957 edition) of the California Achievement Tests in the Fifth Mental Measurements Yearbook. He states that due to the large dual standardization procedures for the achievement and intelligence tests in three hundred and forty-one school systems of the forty-eight states,

> The norms represent the typical performance of pupils throughout the United States. (6, p. 7)

His summary of the complete test battery states that the California Achievement Test Battery is:

> A well constructed achievement test battery designed to measure the basic fundamentals of reading, mathematics and language from grades one through fourteen. This test battery has many desirable features and can be recommended for the measurement of general achievement at the grade levels indicated. (6, p. 7)

English children may not have found specific words on this test that they did not understand, but their major difficulty would be understanding the various types of objective test items, of which the test is totally composed.

These particular California Achievement Tests were chosen for use in this experiment because of their general survey nature, and the fact that achievement in three basic subjects can be tested in one battery. More specifically, it was this same battery of achievement tests that was used by Foster (11) and it was hoped that a study of the findings of the two theses would yield significant information relative to school achievement in the three Commonwealth nations included in the two studies.

The California Short-Form Test of Mental Maturity--Elementary--Grades 4-5-6-7-8 (1957 S Form):

> The California Short-Form Test of Mental Maturity is an instrument for appraising mental development or mental capacity. It reveals information that is basic to any interpretation of present functioning and future potential in a relatively specific but critical area of human activities. . . . By means of carefully selected and validated items, the test samples mental processes in four areas: spatial relationships, logical reasoning, numerical reasoning, and verbal concepts. Two summary scores, Language and Non-Language, together with the four factor scores produce the significant interpretive data of the test. (36, p. 2)

The test consists of seven sub-tests.

Test 1 -- Sensing Right and Left -- 20 items.
Test 2 -- Manipulation of Areas -- 15 items.
Test 3 -- Similarities -- 15 items.
Test 4 -- Inference -- 15 items.
Test 5 -- Number Series -- 10 items.
Test 6 -- Numerical Quantity -- 15 items.
Test 7 -- Verbal Concepts -- 50 items.

Reliability coefficients for the test have been computed by the use of the Kuder-Richardson formula 21. The reliability coefficient for the Language section (sub-tests 4, 6, 7) is .83. The reliability coefficient for the Non-Language section (sub-tests 1, 2, 3, 5) is .80. The reliability coefficient for the total test has been calculated to be .88.

Intelligence Quotient scores on the _California Short-Form Test of Mental Maturity_ show a consistently high correlation with the scores on the _Stanford Binet Intelligence Scale_ (.88 and higher) and with the scores on the _Wechsler Intelligence Scale for Children_ (.80).

Freeman (6) Professor of Psychology at Cornell University states that:

> Data are needed, also regarding validity and reliability of the tests when used with groups of individuals at each of the several levels of ability, that is with the mentally deficient, the slow, the average, the superior and the gifted. It has long been known that a test does not necessarily yield equally sound results at all levels along the scale of mental ability. (5, p. 436)

Milholland (6), Associate Professor of Psychology at the University of Michigan summarizes his review of this intelligence test by stating that:

> The test is an excellent and usable test of general intelligence and has real value for comparing an individual's verbal and non-verbal abilities. (6, p. 439)

No particular words can be identified on the test as being more unfamiliar to the children in Manchester than the children in Edmonton.

However, seven of the fifteen test items on Test 6 (Numerical Quantity) involve "dollars and cents," with which the Manchester children might have been completely unfamiliar. However the success on the majority of these seven items tended to be dependent upon arithmetic reasoning rather than upon arithmetic computation. Comparisons of success with these items for the children in both cities revealed no significant differences in the two groups.

Particular reasons for using this test in this experiment include the fact that it could be used at both age levels involved in the experiment. It was also the test used by Foster (11) and would facilitate later comparisons.

It was recognized that this test might be a less valid measure of the intellectual abilities of the children in the fourteen-year old group than the children in the nine-year old group, as these older children were at the very top of the age-range for which this test is considered to be satisfactory. Any test becomes a less valid measure of the skills that it purports to measure, as the extremities of the standardization population are approached.

PROCEDURE

All of the classes included in the sample in both cities were visited by the writer, and an explanation of the purposes of the testing program was given to the teachers and the pupils concerned. The English reading tests, the Schonell Spelling Test, and the California Short-Form Test of Mental Maturity were administered by the writer in all classrooms.

The complete battery of the *California Achievement Tests* was administered by the class teachers in all classes with the exception of the fourteen-year old classes in Manchester. Remedial teachers from the Manchester Child Guidance Clinic took responsibility for administration of the tests to these pupils.

Information about each child (sex, chronological age, years in school) was obtained from the school records. The average amount of time devoted daily to each of the three basic subjects was also noted for each of the classes included in the Edmonton sample, but this information, although requested could not be obtained in detail for the Manchester sample. Time allotments for the basic subjects at all previous levels of the elementary school program should also be considered if this factor were compared for the two cities, and it is impossible to get an objective measure of this time at the various age levels in different Manchester schools. The assumption that the time allotment for each subject at the various levels of the Edmonton elementary school system is identical to that recommended by the Department of Education may also not be a valid one.

All tests were hand marked by the writer. Standardized reading scores were recorded for the *Watts Sentence Reading Test*. Reading ages were recorded for the *Vernon Sentence Reading Test*. Raw scores were recorded for the *Schonell Spelling Test*. Grade scores were recorded for the sub-tests, and the total test of the *California Achievement Test Battery*. Intelligence quotients were calculated for the Language, Non-Language and total scores on the *California Short-Form Test of Mental Maturity*.

TREATMENT OF DATA

Mean scores and variances of the total scores on each test were calculated and compared for both age groups in both cities. Similar calculations were made for each of the sub-tests on the California Achievement Test Battery, for the Language and Non-Language intelligence quotients on the California Short-Form Test of Mental Maturity and for the chronological ages of the children in each of the age groups in both cities.

Mean scores and variances of the total test scores, and sub-test scores were also calculated and compared for boys and girls separately at both age levels in both cities.

The significance of the differences between the mean scores for each of the groups was tested by the conventional "t" test (9) of significance at the accepted one per cent and five per cent levels.

The significance of the differences between the variances of the two groups was calculated and tested by the conventional "F" test (9) of significance at the accepted two per cent and ten per cent levels.

No correction was necessary in the "t" value in the significance tests in those cases, where the variances of the groups were significantly different because the number of children in each sample is equal and large. In such a situation, the Cochran and Cox formula (9, p. 143) for correcting the "t" value where population variances are unequal is identical to the usual formula used for "t" value calculations normally.

Because of the positively skewed distribution of the children in the gifted group at the nine-year old age level, the non-parametric

median test (9, p. 265) was used to compare the scores of the children in the gifted groups in the two samples.

Because of the very small number of cases in the intellectually-gifted group at the fourteen-year old age level, it was also impossible to use the regular parametric tests of significance in the identification of significant differences for the gifted children at this age level. Differences in this group were tested by using the non-parametric Mann-Whitney U-Test (35).

CONCLUSION

The choice of tests for use in this study might be open to criticism, but the writer would maintain that the chosen battery is a fair representation of the tests available for use in each city, and gives the fairest measurement possible of the achievement and intelligence of the children in the sample from the two cities.

Means and variances of scores present the most meaningful basis for the comparison of the differences in the test results in the two cities.

CHAPTER IV

ANALYSIS OF DATA AND SUMMARY OF FINDINGS

This chapter contains data from the testing of the Edmonton and Manchester children. The thirteen tables were compiled for all the variables, and record information about the differences in the performance of the total groups in each of the samples, the differences in the performance of the boys in the two samples, the differences in the performance of the girls in the two samples, and the differences in the performance of those children in the two samples with intelligence quotients above 130 on the California Short-Form Test of Mental Maturity.

TABLE II

NUMBER OF PUPILS IN THE SAMPLE
FROM MANCHESTER AND
EDMONTON

Sample Tested	Manchester	Edmonton
Total Nine-Year Old Group	169	169
Boys (nine years)	92	99
Girls (nine years)	77	70
Gifted (I.Q. over 130)	30	33
Total Fourteen-Year Old Group	173	173
Boys (fourteen years)	87	89
Girls (fourteen years)	86	84
Gifted (I.Q. over 130)	5	6

Table II shows the number of children included in each of the sub-groups, into which this data has been sub-divided for calculation purposes.

The very small number of pupils in the fourteen-year old group with an I.Q. above 130 may be a function of the structure of the California Short-Form Test of Mental Maturity, on which all the I.Q. scores in this experiment are based. Pupils of fourteen years of age are at the very top of the age-range, for which this particular form of the test is recommended, and since a ratio of mental age and chronological age is used in the calculation of the I.Q. score, the numerator (mental age) of this ratio can never be more than 225 months compared to an average denominator (chronological age) of 172 months. It is impossible for children with a chronological age above 174 months to achieve an I.Q. score above 130 on this test.

Table III presents information indicating the mean intelligence quotient scores of the subjects in the sample from both cities on the Language Section, the Non-Language Section, and the Total Test for the California Short-Form Test of Mental Maturity, and the mean chronological ages of each of the sub-groups and the total groups in the sample from the two cities.

An attempt was made to achieve equality in the mean scores, and the variances of the scores for the chronological ages, the Language I.Q. scores, the Non-Language I.Q. scores, and the total I.Q. scores for the comparable groups in the samples from each city, but this aim was not completely achieved, except for the Non-Language I.Q. scores.

TABLE III

DISTRIBUTION OF SUBJECTS ACCORDING TO CHRONOLOGICAL AGE, SEX, AND I.Q.

	Manchester Children				Edmonton Children			
	Mean C.A.	Mean Lang. I.Q.	Mean Non-L. I.Q.	Mean Total I.Q.	Mean C.A.	Mean Lang. I.Q.	Mean Non-L. I.Q.	Mean Total I.Q.
Age--Nine								
Total Group	111	114	111	113	113	117	115	116
Boys	111	115	112	113	113	118	117	118
Girls	112	113	110	112	114	116	111	114
Gifted	110	136	140	138	109	133	139	136
Age--Fourteen								
Total Group	172	105	106	105	173	110	103	107
Boys	172	106	106	106	175	109	103	106
Girls	172	104	105	105	172	111	103	107
Gifted	170	132	129	130	162	132	133	132

Tables IV and V present information showing the significant differences in the chronological ages, the Language I.Q. scores, the Non-Language I.Q. scores, and the Total Test I.Q. scores on the California Short-Form Test of Mental Maturity for the total nine-year old group, the fourteen-year old group and the sub-groups at each age level in the samples from the two cities.

Chronological Age:

Nine-Year Old Level: The mean chronological age of the Edmonton children

TABLE IV

SUMMARY OF THE CHRONOLOGICAL AGES, AND THE INTELLIGENCE TEST SCORES FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE NINE-YEAR OLD SAMPLE FROM EACH CITY

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Chron. Age (Mo.)	111	113	2	3.48**	1.37	4.21	3.08**
Language I.Q.	114	117	3	1.60	350.76	250.63	1.40*
Non-Lang. I.Q.	111	115	4	1.79	457.31	380.82	1.20
Total I.Q.	113	116	3	1.66	329.89	223.89	1.47**
Boys:							
Chron. Age (Mo.)	111	113	2	2.38*	13.13	53.10	4.04**
Language I.Q.	115	118	3	1.08	402.33	332.67	1.21
Non-Lang. I.Q.	112	117	5	1.58	566.87	396.07	1.43*
Total I.Q.	113	118	5	1.92	407.62	244.40	1.67**
Girls:							
Chron. Age (Mo.)	112	114	2	2.74**	13.32	26.99	2.03**
Language I.Q.	113	116	3	1.07	293.04	281.84	1.04
Non-Lang. I.Q.	110	111	1	.33	340.58	343.33	1.01
Total I.Q.	112	114	2	.83	237.08	188.33	1.26
	Manchester	Edmonton	D	Median N_1+N_2	X^2		
Gifted:							
Chron. Age (Mo.)	110	109	1	109	.0071		
Language I.Q.	136	133	3	133	.76		
Non-Lang. I.Q.	140	139	1	135	.40		
Total I.Q.	138	136	2	135	.73		

* Significant at the .05 level of confidence for the mean scores,
.10 level of confidence for the variances.

** Significant at the .01 level of confidence for the mean scores,
.02 level of confidence for the variances.

TABLE V

SUMMARY OF THE CHRONOLOGICAL AGES, AND THE INTELLIGENCE TEST SCORES FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE FOURTEEN-YEAR OLD SAMPLE FROM EACH CITY

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Chron. Age (Mo.)	172	173	1	1.53	13.12	61.47	4.68**
Language I.Q.	105	110	5	3.60**	201.40	132.65	1.52**
Non-Lang. I.Q.	106	103	3	1.68	288.55	265.76	1.22
Total I.Q.	105	107	2	1.42	189.40	155.05	1.22
Boys:							
Chron. Age (Mo.)	172	175	3	2.97**	12.95	76.11	5.88**
Language I.Q.	106	109	3	1.42	232.38	158.68	1.46*
Non-Lang. I.Q.	106	103	3	1.21	305.23	238.43	1.28
Total I.Q.	106	106	0		212.21	158.61	1.34
Girls:							
Chron. Age (Mo.)	172	172	0		13.45	43.20	3.21**
Language I.Q.	104	111	7	3.88**	170.64	105.23	1.62*
Non-Lang. I.Q.	105	103	2	.77	275.02	297.94	1.08
Total I.Q.	105	107	2	1.03	168.46	152.65	1.10

	Manchester	Edmonton	D	U	p
Gifted:					
Chron. Age (Mo.)	170	162	8	4	.052
Language I.Q.	132	132	0	14	.930
Non-Lang. I.Q.	129	133	4	8	.246
Total I.Q.	130	132	2	6	.126

* Significant at the .05 level of confidence for the mean scores,
.10 level of confidence for the variances.

** Significant at the .01 level of confidence for the mean scores,
.02 level of confidence for the variances.

is significantly higher than the mean chronological age of the Manchester children for the total group in the nine-year old sample, for the boys in the nine-year old sample, and for the girls in the nine-year old sample. The variances of the chronological ages of the total Edmonton nine-year old sample, and the two sex sub-samples in the Edmonton sample are also significantly higher than the variances of the total nine-year old Manchester sample, and the two sex sub-samples at the same age level in the Manchester sample. There is no significant difference in the chronological ages of the intellectually-gifted nine-year old children in the two samples.

Fourteen-Year Old Level: The only significant difference in the mean chronological ages of the sub-groups in the fourteen-year old samples is between the fourteen-year old boys in the samples from the two cities. The mean chronological age of the Edmonton boys is significantly higher than that of the Manchester fourteen-year old boys. The variances of the chronological ages of the children in the total fourteen-year old group, and the children in the two sex sub-groups are significantly higher for the Edmonton children than the Manchester children.

These significant differences in the chronological ages of the children in the two cities may have important effects on the achievement scores of the children in the samples from the two cities. It would seem logical to expect older children to achieve in school at a higher level if other factors are equal.

Children in Manchester schools are grouped in classes according to age levels, and because of the "streaming" of students at each age level

according to their ability and achievement, promotion of students from one form level to the next form level at the end of each school year is almost automatic. A mechanical method of grading by age, rather than by attainments results in a "Lock step" method of promotion where children of the same chronological age stay together year after year. (This method is not equivalent to "social promotion" as it is known on this continent because definite provision is made for each child to work at his own level of achievement regardless of the age level at which he is placed). Hence, when the sample to be used in this experiment was chosen from that population of students near the end of their second year in the Junior School, and those students near the end of their third year in the Secondary School, the range of the children's ages could be no more than twelve months (8 years, 10 months to 9 years, 10 months, and 13 years, 10 months to 14 years, 10 months). It should also be stressed that because of this automatic promotion system, the children in the Manchester sample were chosen from a population that included all the nine-year olds and all the fourteen-year olds in their complete school system.

On the other hand, promotion from grade level to grade level in the Edmonton schools is partly dependent upon achievement, and the possibility of repeating a grade level is much greater in Edmonton schools than in Manchester schools. Hence, when a sample of those students beginning their fourth and ninth grades in Edmonton schools was chosen for this experiment, some of the students included in the sample were one to two years older than the other children in the class, who had proceeded normally through the school grades doing one grade per year, and

were nine and fourteen years of age respectively. The range in age of the Edmonton children was 8 years, 7 months to 11 years, 8 months, and 12 years, 11 months to 16 years, 11 months. It is also true that other children of nine and fourteen years of age in the Edmonton school system were not included in the population, from which the Edmonton sample was chosen because they were repeating a grade in the system lower than the fourth or ninth grades, or had been accelerated and were completing a grade in the system above the fourth or ninth grades.

These significant differences in the chronological ages of the two groups, and the selectivity of the Edmonton sample must be recognized when the achievement of the children in the two samples in the three basic subjects is compared. The greater homogeneity of the achievement of the children in the Edmonton sample, compared to the greater homogeneity of the chronological ages of the children in the Manchester sample may be a result of the differing promotion policies in the two cities.

Total Test I.Q. Scores:

Nine-Year Old Group: The differences in the mean I.Q. scores on the total California Short-Form Test of Mental Maturity for the total nine-year old group in the two cities, and for the sex sub-groups in the nine-year old sample from the two cities are not significantly different, but the observed differences consistently favour the children in the Edmonton sample. The variances of the total I.Q. scores are significantly higher for the children in the Manchester sample than for the children in the Edmonton sample for the total nine-year old groups, and for the nine-year old boys in the sample. This difference may be due to the fact that some

of the pupils at the lower end of the ability scale were not included in the Edmonton sample due to the fact that they were repeating a lower grade than that chosen in the sample. Therefore the spread in the scores of the Edmonton children in the sample would not be as great as the spread in the scores of the Manchester children in the sample, which included the whole ability range.

Fourteen-Year Old Group: There are no significant differences in the mean total I.Q. scores of the fourteen-year old children in the total samples from the two cities, nor for any of the sub-groups in the samples from the two cities. Neither are any of the differences in the variances of the total I.Q. scores for the total group, or any of the sub-groups in the samples from the two cities significantly different at the accepted level.

The Intelligence Test, from which these scores were obtained (The California Short-Form Test of Mental Maturity) was published and standardized on the North-American continent, and therefore may be a better measure of the ability of children in North America than in Britain. No tests can be completely free of cultural influences. This test may not provide completely accurate results for the Manchester children. However reviewers of this test have continually emphasized its continued reliable use in general surveys of this type in a number of different English-speaking countries.

Language I.Q. Scores:

Nine-Year Old Group: There are no significant differences in the mean

Language I.Q. scores of the total nine-year old sample from the two cities, or in the mean Language I.Q. scores of the sex sub-groups in the samples from the two cities, but the observed differences favour the children in the Edmonton sample. The variance of the Language I.Q. scores is significantly higher (at the 5% level of significance) for the total group in the Manchester sample than for the total group in the Edmonton sample. There are no significant differences in the variances of the Language I.Q. scores for either of the sex sub-groups in the samples from the two cities.

Fourteen-Year Old Group: The mean Language I.Q. score of the fourteen-year old total group in the Edmonton sample is significantly higher than the mean Language I.Q. score of the total group in the Manchester sample. This same significance in favour of the Edmonton children is true for the fourteen-year old girls in the sample. The difference in the mean Language I.Q. scores of the fourteen-year old boys in the two samples is not significant at the accepted level, but it does favour the boys in the Edmonton sample. The variances of the Language I.Q. scores for the total group, the boys' sub-groups and the girls' sub-groups are significantly higher for the Manchester children than for the Edmonton children in the sample.

These significant differences in the mean Language I.Q. scores of the fourteen-year old girls in the samples from the two cities may be due to a real difference in the language facility of girls in the two societies. Perhaps fourteen-year old girls in Edmonton are encouraged, and have more opportunities to become more verbally competent than girls in

Manchester, and it is this competency that is measured on the Language section of the *California Short-Form Test of Mental Maturity*. It may also be that the cultural upbringing of girls on this continent, which has been shown to yield significant differences in the language abilities of girls and boys during their teen-age years is not identical to the growing-up "climate" of girls in Britain, which may not produce the same sex differences in language abilities.

The Manchester children, particularly the girls may have had some difficulty in understanding the test items, or the approach to some of the items, as they would not be nearly as familiar with "multiple-choice" test items as the children in the Edmonton sample.

However the fact that this significant difference in the mean Language I.Q. scores of the children in the two samples is evident at the fourteen-year old level, and not at the nine-year old level indicates that difficulty in understanding the concepts presented on the test, and lack of facility with "multiple-choice" test items cannot be used to explain this significant difference. If such difficulties did present an important problem, they would surely be much more likely to cause a significant difference in the mean Language I.Q. scores of the two groups at the nine-year old level than at the fourteen-year old level. Again, there is the possibility that this *California Short-Form Test of Mental Maturity* (Elementary Level) is not a valid measurement of the ability of children at the fourteen-year old age level.

Differences in the variances of the Language I.Q. scores for the two groups may indicate that learned knowledge plays an influential part

on the scores of children for this particular intelligence test, or again that the children in the Edmonton sample are from a selected population, which does not contain a representative proportion of children in the lowest or highest ranges of intelligence. Whatever its cause, this significant difference must be recognized when comparing the achievement in specific school subjects for the children in the samples from the two cities.

Non-Language I.Q. Scores:

Nine-Year Old Group: There are no significant differences in the mean Non-Language I.Q. scores for the total sample of nine-year old children from each city, nor for either of the sex sub-groups in the samples from the two cities. The only significant difference in the variance of the Non-Language I.Q. scores is for the boys' sub-groups in the two samples. The variance of the Non-Language I.Q. scores for the boys in the Manchester sample is significantly higher than that of the boys in the Edmonton sample.

Fourteen-Year Old Group: There are no significant differences in the mean Non-Language I.Q. scores, or the variances of these scores for the total group at this age level in the samples from the two cities, or for either of the sex sub-groups in the two samples.

This uniformity in the mean scores and the variances of the scores on the Non-Language section of the California Short-Form Test of Mental Maturity, as compared to the Language section of the same test would appear to indicate that the Non-Language section of the test is more "culture-free", and therefore gives a more valid measurement of the

ability of the children in the two age-groups in the samples from both cities. Since all other tests used in the experiment are "language-loaded", the uniform results for the non-verbal intelligence test for the children in the two samples form a good basis for the interpretation of the differences in the scores on the achievement tests for the children in the two samples.

Tables VI and VII present information relative to the differences in the performances of the children in the samples from the two cities on the _Watts Sentence Reading Test_ (for the nine-year old children), the _Vernon Sentence Reading Test_ (for the fourteen-year old children), the _Schonell Spelling Test_ and the complete battery score for the _California Achievement Tests_.

Watts Sentence Reading Test:

Nine-Year Old Group: There are no significant differences in the mean reading scores on this test for the total group sample from each city, for the boys in the sample from each city, or for the girls in the sample from each city. However the reading scores of the Manchester children in the intellectually-gifted group are significantly higher than those of the Edmonton children in the comparable group.

There are no significant differences in the variances of the reading scores on this test for the total group in the samples from the two cities, or for either of the two sex sub-groups.

Since this sentence reading test was published and standardized in England, the children in the Manchester sample would have no difficulty

TABLE VI

SUMMARY OF THE TEST RESULTS FOR THE ENGLISH ACHIEVEMENT TESTS IN READING AND SPELLING, AND FOR THE TOTAL BATTERY OF THE CALIFORNIA ACHIEVEMENT TESTS FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE NINE-YEAR OLD SAMPLE FROM THE TWO CITIES

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Watts Reading	101	99	2	1.34	211.72	165.32	1.28
Schonell Spelling	41	45	4	** 2.63	240.02	150.06	** 1.60
Calif. Achieve. Battery	5.4	5.9	.5	** 4.31	148.08	79.15	** 1.87
Boys:							
Watts Reading	101	98	3	1.41	244.74	188.13	1.30
Schonell Spelling	41	42	1	.475	260.60	165.83	* 1.57
Calif. Achieve. Battery	5.3	5.8	.5	** 3.15	155.95	86.54	** 1.80
Girls:							
Watts Reading	100	100	0		178.93	134.88	1.33
Schonell Spelling	41	48	7	** 3.27	218.54	112.58	** 1.94
Calif. Achieve. Battery	5.4	6.0	.6	** 3.53	140.95	67.64	** 2.08

	Manchester	Edmonton	D	Median N_1+N_2	X^2
Gifted Group:					
Watts Reading	114	108	6	110	* 3.55
Schonell Spelling	55	53	2	54	.41
Calif. Achieve. Battery	6.6	6.6	0	6.7	.0071

* Significant at the .05 level of confidence for the means,
.10 level of confidence for the variances, and X^2

** Significant at the .01 level of confidence for the means,
.02 level of confidence for the variances.

TABLE VII

SUMMARY OF THE TEST RESULTS FOR THE ENGLISH ACHIEVEMENT TESTS IN READING AND SPELLING, AND FOR THE TOTAL BATTERY OF THE CALIFORNIA ACHIEVEMENT TESTS FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE FOURTEEN-YEAR OLD SAMPLE FROM THE TWO CITIES

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Vernon Reading	15	15	0		6.59	4.86	1.36
Schonell Spelling	73	85	12	**8.29	271.10	91.81	**2.96
Calif. Achieve. Battery	8.8	10.5	1.7	**11.13	294.85	108.61	**2.71
Boys:							
Vernon Reading	15	15	0		7	5.20	1.35
Schonell Spelling	70	82	12	**5.48	305.26	119.34	**2.56
Calif. Achieve. Battery	8.7	10.4	1.7	**7.52	315.88	136.52	**2.31
Girls:							
Vernon Reading	15	15	0		6.25	4.55	1.37
Schonell Spelling	76	88	12	**6.79	219.52	44.10	**4.98
Calif. Achieve. Battery	8.8	10.7	1.9	**9.35	275.54	73.71	**3.74

	Manchester	Edmonton	D	U	p
Gifted:					
Vernon Reading	18	17	1	6	.126
Schonell Spelling	87	94	7	9	.330
Calif. Achieve. Battery	11.4	12.1	.7	8	.246

* Significant at the .05 level of confidence for the means,
.10 level of confidence for the variances.

** Significant at the .01 level of confidence for the means,
.02 level of confidence for the variances.

with the vocabulary, or the content of the test. Nor were they unfamiliar with the format of the test, the type of item presented, or the method of test administration. These three factors should have presented no difficulty to the children in the Edmonton sample either, because of the frequency of the many types of test administrations in the Edmonton classrooms.

The meanings of certain words on this test that may have presented difficulty to the Edmonton children have been identified in Chapter III. Most of these words appeared near the beginning of the test, and this section of the test paper did not appear to present serious difficulties to the majority of the children in the Edmonton sample.

Vernon Sentence Reading Test:

Fourteen-Year Old Group: There is no significant difference in the mean reading age of the total group of Manchester children in the sample compared to the mean reading age of the total group of Edmonton children in the sample. Nor are there any significant differences in the mean reading ages of either of the sex sub-groups in the samples from each city, or in the reading ages of the children in the intellectually-gifted groups in the sample from each city.

There are no significant differences in the variances of the scores for the total samples from each city, or for either of the sex sub-groups in the two city samples.

This sentence reading test was also published and standardized on an English population, and hence decreases the difficulty with word meanings that the Manchester children might have experienced on certain

sections of the California Achievement Tests. No serious word meaning difficulties were noted on this test for the Edmonton children, and it should be indicated that such difficulties, if they do exist might be as serious a problem to some Manchester children, as to the Edmonton children. The semantic meaning of certain words in England may differ as much from one geographical area of England to another, as from England to Canada, or more precisely, from Manchester to Edmonton.

Schonell Spelling Test:

Nine-Year Old Group: The mean spelling scores for the Edmonton children on this test are significantly higher than those of the Manchester children for the total group sample, and for the girls' sample. There is no significant difference in the mean spelling scores for the boys' sample, or in the scores for those children in the samples from the two cities with I.Q. scores above 130.

The variances of the spelling scores on this test are significantly higher for the Manchester children than for the Edmonton children for the total group sample in the two cities, for the boys in the two samples, and for the girls in the two samples.

Fourteen-Year Old Group: The mean spelling scores for the Edmonton children are significantly higher than those of the Manchester children in comparable groups for the total group sample, the boys' sample and the girls' sample in the two cities. There is no significant difference in the spelling scores of the intellectually-gifted groups in the samples from the two cities.

The variances of the spelling scores on this test are significantly higher for the Manchester children than for the Edmonton children for the total group sample, for the boys' sample, and for the girls' sample in the two cities.

The words on this spelling test were selected on the basis of tests administered in England, hence any significant differences in the spelling scores of the children in the samples from the two cities (in favour of the children in the Edmonton sample) should not be attributable to cultural factors in the words selected for the test. No words on the test should be unfamiliar to the Edmonton children at the indicated grade levels.

It is interesting to note that there are no significant sex differences in the spelling achievement of the nine-year old boys and girls in the Manchester sample, while the mean spelling score of the nine-year old girls in the Edmonton sample is significantly higher than that of the nine-year old boys in the Edmonton sample. Spelling scores for the girls' sub-group in both Manchester and Edmonton are significantly higher than those of the boys at the fourteen-year old age level.

The teaching of spelling in a formalized manner continues throughout the Elementary School program in Edmonton. Specific textbooks have been authorized by the Department of Education, and a definite number of words are studied each week at each grade level. No such organized program exists in the Manchester Junior Schools.

California Achievement Tests: (The Complete Battery)

Nine-Year Old Group: The mean achievement grade scores for the children

in the Edmonton sample are significantly higher than those of the children in the Manchester sample for the total groups in the two samples, for the boys' sample and for the girls' sample. The mean achievement grade scores are identical for the intellectually-gifted groups in the samples from the two cities.

The variances of these achievement grade scores are significantly higher for the Manchester children than the Edmonton children in the total group sample, the boys' sample and the girls' sample.

Fourteen-Year Old Group: The mean achievement grade scores of the children in the Edmonton sample are significantly higher than those of the children in the Manchester sample for the total groups in the two samples, for the boys' sample and for the girls' sample. There is no significant difference in the achievement scores of the children in the intellectually-gifted groups in the two cities.

The variances of the achievement grade scores for the Manchester children are significantly higher than those of the Edmonton children in the total group sample, and the two sex sub-group samples.

Specific difficulties on the sub-tests of this complete battery for the Manchester children are discussed for the three basic subjects in the following pages. The achievement grade scores that are included in Tables VI and VII for this test are based on a combined average of the scores on the six sub-tests included in the test battery. This combined score for all the sub-tests in the three basic subjects' tests is the most reliable score yielded by the test, and is based on a wide sampling of the content and skills normally acquired in the educational program of any country.

TABLE VIII

SUMMARY OF THE TEST RESULTS FOR THE CALIFORNIA ACHIEVEMENT TEST IN READING FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE NINE-YEAR OLD SAMPLE FROM THE TWO CITIES

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Reading Vocab.	5.6	6.2	.6	4.96**	192.67	55.68	3.46**
Reading Comp.	4.9	5.8	.9	7.99**	178.56	36.22	4.93**
Total Reading	5.3	6.0	.7	5.34**	172.03	119.05	1.45**
Boys:							
Reading Vocab.	5.7	6.1	.4	2.23*	191.47	117.51	1.63**
Reading Comp.	4.9	5.7	.8	4.25**	166.33	170.96	1.03
Total Reading	5.3	5.9	.6	3.44**	163.84	127.07	1.29
Girls:							
Reading Vocab.	5.6	6.3	.7	3.40**	195.37	111.17	1.76**
Reading Comp.	4.9	5.9	1.0	4.71**	195.55	132.14	1.48*
Total Reading	5.3	6.1	.8	3.99**	184.11	107.57	1.71**

	Manchester	Edmonton	D	Median N_1+N_2	X^2
Gifted:					
Reading Vocab.	6.9	6.8	.1	6.8	.40
Reading Comp.	6.4	6.8	.4	6.6	2.7
Total Reading	6.7	6.8	.1	6.9	.86

* Significant at the .05 level of confidence for the mean scores,
.10 level of confidence for the variances.

** Significant at the .01 level of confidence for the mean scores,
.02 level of confidence for the variances.

TABLE IX

SUMMARY OF THE TEST RESULTS FOR THE CALIFORNIA ACHIEVEMENT TEST IN READING FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE FOURTEEN-YEAR OLD SAMPLE FROM THE TWO CITIES

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Reading Vocab.	9.3	10.5	1.2	7.59**	327.23	104.98	3.12**
Reading Comp.	9.0	11.1	2.1	9.34**	544.91	329.72	1.65**
Total Reading	9.2	10.8	1.6	8.91**	385.64	172.28	2.24**
Boys:							
Reading Vocab.	9.2	10.4	1.2	5.03**	370.06	133.91	2.76**
Reading Comp.	9.0	11.1	2.1	6.41**	567.17	379.66	1.49
Total Reading	9.1	10.8	1.7	6.38**	418.20	208.81	2.00**
Girls:							
Reading Vocab.	9.4	10.6	1.2	5.81**	285.27	74.51	3.83**
Reading Comp.	8.9	11.2	2.3	7.42**	527.89	286.49	1.84**
Total Reading	9.2	10.9	1.7	7.05**	356.85	134.67	2.65**

	Manchester	Edmonton	D	U	p
Gifted:					
Reading Vocab.	11.6	11.7	.1	14	.930
Reading Comp.	13.6	13.6	0	11	.536
Total Reading	12.6	12.7	.1	13	.792

* Significant at the .05 level of confidence for the mean scores,
.10 level of confidence for the variances.

** Significant at the .01 level of confidence for the mean scores,
.02 level of confidence for the variances.

The California Reading Tests:

Tables VIII and IX present information relative to the differences in the performance of the children in the samples from the two cities on the reading section of the California Achievement Test Battery. Test results for the total groups at each age level, the boys at each age level, the girls at each age level, and those children at each age level with I.Q. scores above 130 on the California Short-Form Test of Mental Maturity are included in the two tables.

The mean reading grade scores of the Edmonton children in the total samples at both the nine-year old, and the fourteen-year old age levels were significantly higher than the comparable children in the Manchester sample on the reading vocabulary and on the reading comprehension sub-tests. The same significant differences in favour of the Edmonton children were identified when the boys and girls in the two samples were considered separately.

However the variances of the reading grade scores at both age levels included in this experiment were significantly higher for the Manchester children than for the Edmonton children for the total groups in the two samples at both age levels, and for all of the sex sub-groups with the exception of the variance of the scores for the fourteen-year old boys in the two samples on the reading comprehension sub-test, where there was no significant difference in the variance of the grade scores for the two sample sub-groups.

These significant differences indicate a greater range in the reading grade scores of the Manchester children than in the scores of

the Edmonton children. The program of reading instruction in the Edmonton schools may produce a higher average level of reading achievement among the Edmonton pupils but the Manchester reading program evidently tends to widen the range of individual differences in the reading achievement of the pupils, with which it is concerned more significantly than does the Edmonton program. There is definite provision in Manchester classrooms for children to read books in their reading program that are at their level of reading ability, rather than books for the grade level at which they happen to be. Such provision increases the opportunity for children to work up to their maximum capacity, and hence widens the spread in the achievement of the students at any specific age level.

There were no significant differences in the reading grade scores for reading comprehension, or for reading vocabulary for the intellectually-gifted sub-groups at both age levels in the two samples. One of the most important observations from these findings is that the generally superior reading grade scores of the Edmonton children over the Manchester children are not maintained when only those children in the high intellectual ability group are considered -- another indication perhaps that the prescriptive uniformity of the curriculum (including authorized readers, workbooks and guidebooks) of the Edmonton schools does not present sufficient challenge for the children of high intellectual ability.

These achievement tests in reading, like the intelligence test used in this experiment were published and standardized in North America, and the test may therefore be a better test of the reading ability of children in Edmonton than that of children in Manchester.

Definite provision for the teaching of the subject matter vocabulary on this test is made in the Courses of Study for the Edmonton schools from the Alberta Department of Education. Emphasis is placed on the fact that all teachers are teachers of reading, and are particularly responsible for the teaching of the specific vocabulary relative to their content subject. Such planned provision for the teaching of vocabulary is not evident in the Manchester schools' program.

Much Social Studies content relative to the North American continent appears in the paragraphs of the reading comprehension sub-test. The Manchester children could not be expected to be as familiar with this material as the Edmonton children, and it is evident that familiarity with a given topic, and the vocabulary used in presenting it is a valuable aid to reading comprehension.

The number of figures on the reading comprehension sub-test might also have overwhelmed the Manchester children. One of the three sections on this part of the test is composed almost completely of charts and figures, which receive much greater emphasis in the Edmonton child's school program than in the Manchester child's school program.

Again on this test, the items are completely composed of multiple-choice test items, with which the Manchester children, particularly the nine-year olds have had very limited experience.

The fact that the variances of the scores on this test are significantly higher for the Manchester children than the Edmonton children at both age levels, may again be indicative that the school program in Manchester schools makes more provision for individual differences in

students, and hence widens the gap in the standards of achievement for children at any age level. From the writer's personal observations, it seemed evident that children do move at their own speed in Manchester classrooms. "Streaming" of children according to their ability is a common practice in British schools, and all children in the Manchester sample attended schools, where "streaming" was in practice. The division of the children at one age level into A, B, C, and D streams makes it even more possible to differentiate the instructional program according to the children's abilities, and hence widens the spread in the achievement of children at any age level. When a partial division of this type is attempted in Edmonton (The Continuous-Progress System), and all children in the Edmonton sample were in schools of this type, the instructional program is still very limited in the possible provisions for individual differences because of the prescriptive nature of the Department of Education's curriculum.

The California Arithmetic Tests:

Tables X and XI present information relative to the differences in the performance of the children in the samples from the two cities on the arithmetic section of the *California Achievement Test Battery*. Test result summaries for the total groups at each age level, the boys at each age level, the girls at each age level, and those children at each age level with I.Q. scores above 130 on the *California Short-Form Test of Mental Maturity* are included in the two tables.

The mean arithmetic grade scores for the Edmonton children at both age levels included in this experiment are significantly higher than those

TABLE X

SUMMARY OF THE TEST RESULTS FOR THE CALIFORNIA ACHIEVEMENT TEST IN ARITHMETIC FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE NINE-YEAR OLD SAMPLE FROM THE TWO CITIES

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Arith. Reas.	5.5	5.9	.4	** 3.33	146.52	97.46	** 1.50
Arith. Fund.	5.4	5.0	.4	** 3.57	160.02	50.83	** 3.15
Total Arith.	5.5	5.5	0		130.09	53.33	** 2.61
Boys:							
Arith. Reas.	5.6	6.0	.4	* 2.38	176.45	96.90	** 1.82
Arith. Fund.	5.3	5.1	.2	1.29	179.74	55.44	** 3.24
Total Arith.	5.5	5.6	.1	.663	165.13	56.01	** 2.95
Girls:							
Arith. Reas.	5.4	5.9	.5	** 2.96	110.28	98.75	1.12
Arith. Fund.	5.5	4.9	.6	** 3.78	136.76	43.26	** 3.16
Total Arith.	5.5	5.4	.1	.672	109.74	49.46	** 2.22

	Manchester	Edmonton	D	Median $N_1 + N_2$	X^2
Gifted:					
Arith. Reas.	6.8	6.6	.2	6.7	.10
Arith. Fund.	6.6	5.4	1.2	5.9	** 24.14
Total Arith.	6.7	6.0	.7	6.4	* 4.47

* Significant at the .05 level of confidence for the mean scores, and X^2
.10 level of confidence for the variances.

** Significant at the .01 level of confidence for the mean scores, and X^2
.02 level of confidence for the variances.

TABLE XI

SUMMARY OF THE TEST RESULTS FOR THE CALIFORNIA ACHIEVEMENT TEST IN ARITHMETIC FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE FOURTEEN-YEAR OLD SAMPLE FROM THE TWO CITIES

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Arith. Reas.	8.6	10.8	2.2	14.52**	295.87	101.52	2.90**
Arith. Fund.	8.3	10.9	2.6	14.44**	367.52	193.26	1.90**
Total Arith.	8.5	10.9	2.4	15.29**	305.24	121.15	2.52**
Boys:							
Arith. Reas.	8.8	10.9	2.1	9.66**	309.24	109.41	2.83**
Arith. Fund.	8.4	10.7	2.3	8.66**	390.83	231.67	1.69*
Total Arith.	8.6	10.8	2.2	9.61**	325.03	138.41	2.35**
Girls:							
Arith. Reas.	8.4	10.7	2.3	11.02**	276.21	92.13	3.00**
Arith. Fund.	8.3	11.1	2.8	11.58**	346.98	148.51	2.34**
Total Arith.	8.3	10.9	2.6	12.13**	284.76	103.96	2.74**
	Manchester	Edmonton	D	U	p		
Gifted:							
Arith. Reas.	11.0	11.7	.7	8	.246		
Arith. Fund.	10.8	12.6	1.8	5	.082		
Total Arith.	10.9	12.2	1.3	6	.126		

* Significant at the .05 level of confidence for the mean scores,
.10 level of confidence for the variances.

** Significant at the .01 level of confidence for the mean scores,
.02 level of confidence for the variances.

of the Manchester children on the Arithmetic Reasoning sub-test for the total group in the samples from each city, and for the two sex sub-samples. There are no sigificant differences in the scores on this same sub-test for the intellectually-gifted groups at either age level.

The mean arithmetic grade scores on the Arithmetic Fundamentals sub-test are significantly higher for the Manchester nine-year old children than for the Edmonton nine-year old children for the total group, and the girls' sub-group. Scores for the Manchester nine-year old children in the intellectually-gifted sub-group are also significantly higher on this Arithmetic Fundamentals sub-test than are those of their Edmonton counterparts. There is no significant difference in the mean grade scores of the two boys' sub-groups on this sub-test. The mean grade scores on the Arithmetic Fundamentals sub-test are significantly higher for the fourteen-year old children in the Edmonton sample than for their Manchester counterparts for the total group sample, and for the two sex sub-samples. There is no significant difference in the scores for the fourteen-year old children on this sub-test for the intellectually-gifted groups in the two cities.

The variances of the arithmetic grade scores are significantly higher for the Manchester children than for the Edmonton children on both the Arithmetic Reasoning, and the Arithmetic Fundamentals sub-tests at both age levels.

Again the wider range in the scores of the Manchester children over the Edmonton children is very noticeable. Perhaps even more interesting is the complete reversal of the superior scores of the children in

the two cities on the two sub-tests of the Total Arithmetic test at the nine-year old age level. This difference would appear to be completely a function of the differences in the instructional programs in arithmetic in the two cities.

It was on the Arithmetic Fundamentals sub-test only, of the six sub-tests of the California Achievement Test Battery that the mean scores of the Manchester children significantly exceeded the mean scores of the Edmonton children at the nine-year old age level. A very high percentage of the time allotment for arithmetic is devoted to developing facility in arithmetic calculations in the Manchester Infant and Junior Schools. Time allotment for the total arithmetic program is also significantly higher in the Manchester schools than in the Edmonton schools. Daily life in England requires that citizens be able to do fairly complex arithmetic calculations without the use of a pencil. Their monetary system, and many of their common measurements do not have the same base as the Hindu-Arabic number system, and facility in their use demands ability in "mental arithmetic" and quick calculations with arithmetical fundamental operations that are not necessary for Canadian citizens. Hence, drill in the fundamental arithmetic operations, in both oral and written form is a very common activity in the Junior School classrooms in Manchester.

All these test items were again of the multiple-choice test type, but there is an important difference between the multiple-choice test items on this sub-test, and those on other sub-tests of this battery. For this sub-test, the child does the arithmetic calculations first, then locates his answer among the choices given, rather than having to formulate

the correct answer, and recognize it concurrently, the skill that is required for the reading sub-tests of the battery. The former type of item would apparently present a less difficult task to children that have had no experience with objective test items of this type. Some of the multiple-choice test items include the additional instruction, with which the Manchester children at both age levels might be completely unfamiliar of indicating that none of the possible answers given are correct.

The arithmetic program in the Manchester schools is particularly flexible, and provides opportunity for the more capable students to acquire basic arithmetical concepts much more quickly than the "average" students. The program in Manchester is not tied to any specific textbook for any age level, and the rate of progress can be completely determined by the abilities of the students in any particular class. The arithmetic program in Edmonton schools tends to be identified with a specific textbook for each grade level, and most of the children have few opportunities to gain concepts that are not introduced in the assigned textbook for their grade level. Hence, there is a tendency to encourage uniformity of performance among the Edmonton students, and decrease the spread of their achievement over a wide range.

The California Language Tests:

Tables XII and XIII present information relative to the differences in the performance of the children in the samples from the two cities on the Language section of the California Achievement Test Battery. Test result summaries for the total group at each age level, the boys at each age level, the girls at each age level, and those children at each age

TABLE XII

SUMMARY OF THE TEST RESULTS FOR THE CALIFORNIA ACHIEVEMENT TEST IN LANGUAGE FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE NINE-YEAR OLD SAMPLE FROM THE TWO CITIES

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Mech. of Eng.	5.1	6.1	1.0	7.49**	161.52	140.43	1.15
Spelling	5.5	6.0	.5	3.25**	245.19	155.10	1.58**
Total Lang.	5.3	6.1	.8	6.04**	178.21	118.79	1.50**
Boys:							
Mech. of Eng.	5.0	6.0	1.0	5.78**	149.34	136.93	1.09
Spelling	5.4	5.8	.4	1.87	266.04	172.62	1.54*
Total Lang.	5.2	5.9	.7	3.93**	182.57	122.59	1.49*
Girls:							
Mech. of Eng.	5.2	6.4	1.2	5.80**	175.36	136.90	1.28
Spelling	5.5	6.3	.8	3.68**	222.24	118.30	1.88**
Total Lang.	5.4	6.4	1.0	5.12**	173.33	103.07	1.68*

	Manchester	Edmonton	D	Median $N_1 + N_2$	X^2
Gifted:					
Mech. of Eng.	6.2	6.8	.6	6.5	8.76**
Spelling	6.7	6.7	0	6.8	.43
Total Lang.	6.5	6.8	.3	6.6	5.84*

* Significant at the .05 level of confidence for the means, and X^2,
.10 level of confidence for the variances.

** Significant at the .01 level of confidence for the means, and X^2,
.02 level of confidence for the variances.

TABLE XIII

SUMMARY OF THE TEST RESULTS FOR THE CALIFORNIA ACHIEVEMENT TEST IN LANGUAGE FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE FOURTEEN-YEAR OLD SAMPLE FROM THE TWO CITIES

	Mean Scores				Variances		
	Manchester	Edmonton	D	t	Manchester	Edmonton	F
Total Group:							
Mech. of Eng.	8.8	10.1	1.3	7.02**	386.21	208.13	1.86**
Spelling	8.4	9.7	1.3	7.29**	388.80	161.15	2.41**
Total Lang.	8.6	9.9	1.3	7.82**	333.60	145.22	2.30**
Boys:							
Mech. of Eng.	8.5	9.7	1.2	4.52**	385.83	237.31	1.63*
Spelling	7.9	9.2	1.3	5.16**	368.28	192.10	1.92**
Total Lang.	8.2	9.5	1.3	5.53**	324.36	164.65	1.97**
Girls:							
Mech. of Eng.	9.1	10.4	1.3	5.21**	375.15	152.19	2.46**
Spelling	8.8	10.3	1.5	6.51**	372.54	75.48	4.94**
Total Lang.	9.0	10.4	1.4	6.40**	318.54	86.49	3.68**

	Manchester	Edmonton	D	U	p
Gifted:					
Mech. of Eng.	11.6	11.8	.2	13	.792
Spelling	9.7	10.9	1.2	6	.126
Total Lang.	10.7	11.4	.7	9	.330

* Significant at the .05 level of confidence for the means,
.10 level of confidence for the variances.
** Significant at the .01 level of confidence for the means,
.02 level of confidence for the variances.

level with I.Q. scores above 130 on the California Short-Form Test of Mental Maturity are included in the two tables.

The mean grade scores for the Edmonton children in the total sample at both age levels were significantly higher than those of the Manchester children on the Mechanics of English sub-test, and the Spelling sub-test of this Language test. This superiority was true for the total groups at each age level, and the two sex sub-groups with the exception of the nine-year old boys on the Spelling sub-test, where there was no significant difference in the mean grade scores of the Edmonton and Manchester sub-groups. The mean scores for the boys in both cities were below those of the girls in the same city.

There were no significant differences in the grade scores of the intellectually-gifted group at either age level on the two Language sub-tests with the exception of the Mechanics of English sub-test for the nine-year old children, where the scores of the Edmonton children were significantly higher than those of their Manchester counterparts. The unusual format and directions for the completion of this particular sub-test may have affected the scores. This was the only sub-test on the California Achievement Test Battery, on which the scores of the Edmonton children in the intellectually-gifted group significantly exceeded those of the Manchester children in the comparable group.

The variances of the Language grade scores were significantly higher for the Manchester children than for the Edmonton children on both sub-tests at both age levels for the total groups, and the two sex sub-groups with the exception of the Mechanics of English sub-test for the

nine-year old children where there were no significant differences in the variances of the scores for the total group, or the two sex sub-groups.

The sub-test on the knowledge of Mechanics of English seemed to present more difficulty to the Manchester children in all sub-groups at both age levels than any of the other sub-tests on the complete battery of the California Achievement Tests. All the sections on capitalization, punctuation and word usage are presented in a very different format than that with which the Manchester children are familiar. Great difficulty was experienced in the explanation of the directions to the Manchester children during the administration of the test, particularly to the nine-year old group in the Manchester sample, and to the lower streams in the fourteen-year old group.

This whole sub-test emphasizes evaluation of the students' mechanical skill in the use of language, which is considered of minor importance in the written language program of the Manchester schools. Exercises of the type presented on this sub-test do not play a part in the written language program of the schools. The emphasis in written language is on writing, and Manchester children are seldom asked to isolate specific mechanical writing skills, a task, which is essential to success on this test. The results for language might be quite different if a different type of language test were administered to both of the selected groups. Edmonton children are much more familiar with this type of exercise, which may explain why all Edmonton groups did significantly better on this particular sub-test than the comparable Manchester groups. It has previously been mentioned that an objective comparison of the achievement

of children in two different countries in Language achievement is much more difficult than a similar comparison in reading, and arithmetic because of the scope of the Language Arts. This particular sub-test of the California Achievement Tests is not a very useful basis to use for such a beginning comparison.

The spelling sub-test utilizing the Spelling evaluation approach of recognizing misspelled words rather than recalling correctly spelled words is more likely to have been a completely new type of spelling test to the Manchester children than to the Edmonton children. Most spelling tests in Manchester take the form of an oral dictation requiring the recall of the correct spelling form of the dictated word.

These two sub-tests test a very limited aspect of achievement in the Language Arts, but the average achievement of the Edmonton children on these two limited components of language learning appear to excel that of the comparable Manchester children.

Summary of All Test Results:

Table XIV presents a summary of the significant differences for all the tests administered to the samples from the two cities in this experiment.

The general findings for each of the three basic subjects have been summarized under the appropriate test for each of the subjects concerned. The mean chronological ages of the children in the Edmonton sample were significantly higher than those of the Manchester children in the nine-year old part of the sample, but there were no significant differences in the mean chronological ages of the children in the two

TABLE XIV

SUMMARY OF THE TESTS OF SIGNIFICANCE FOR THE DIFFERENCES IN THE MEAN SCORES AND VARIANCES FOR THE TOTAL GROUP AND THE SUB-GROUPS IN THE TWO CITY SAMPLES AT BOTH AGE LEVELS FOR ALL TESTS ADMINISTERED

	C.A.	Lang. I.Q.	Non-Lang. I.Q.	Total I.Q.	Watts	Schonell	Rdg. Vocab.	Rdg. Comp.	Total Rdg.	Arith. Reas.	Arith. Fund.	Total Arith.	Mech. of Eng.	Spelling	Total Lang.	Total Battery
Nine-Year Olds:																
Means																
Total Group Edmonton--Manchester	E .01	N.S.D.	N.S.D.	N.S.D.	N.S.D.	E .01	E .01	E .01	E .01	E .01	M .01	N.S.D.	E .01	E .01	E .01	E .01
Boys $E_9 - M_9$	E .05	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	E .05	E .01	E .01	E .05	N.S.D.	N.S.D.	E .05	N.S.D.	E .01	E .01
Girls $E_9 - M_9$	E .01	N.S.D.	N.S.D.	N.S.D.	N.S.D.	E .01	E .01	E .01	E .01	E .01	M .01	N.S.D.	E .01	E .01	E .01	E .01
Variances																
Total Group $E_9 - M_9$	E .02	M .10	N.S.D.	M .02	N.S.D.	M .02	M .02	M .02	M .02	M .02	M .02	M .02	N.S.D.	M .02	M .02	M .02
Boys $E_9 - M_9$	E .02	N.S.D.	M .10	M .02	N.S.D.	M .10	M .02	N.S.D.	N.S.D.	M .02	M .02	M .02	N.S.D.	M .10	M .10	M .02
Girls $E_9 - M_9$	E .02	N.S.D.	N.S.D.	N.S.D.	N.S.D.	M .02	M .02	M .10	M .10	N.S.D.	M .02	M .02	N.S.D.	M .02	M .10	M .02
Medians:																
Gifted (over 130)	N.S.D.	N.S.D.	N.S.D.	N.S.D.	M .10	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	M .01	M .05	E .01	N.S.D.	E .05	N.S.D.
Fourteen-Year Olds:					Vernon											
Means																
Total Group $E_{14} - M_{14}$	N.S.D.	E .01	N.S.D.	N.S.D.	N.S.D.	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01
Boys $E_{14} - M_{14}$	E .01	N.S.D.	N.S.D.	N.S.D.	N.S.D.	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01
Girls $E_{14} - M_{14}$	N.S.D.	E .01	N.S.D.	N.S.D.	N.S.D.	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01	E .01
Gifted (over 130)	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.
Variances																
Total Group $E_{14} - M_{14}$	E .02	M .02	N.S.D.	N.S.D.	M .10	M .02	M .02	M .02	M .02	M .02	M .02	M .02	M .02	M .02	M .02	M .02
Boys $E_{14} - M_{14}$	E .02	M .10	N.S.D.	N.S.D.	N.S.D.	M .02	M .02	M .10	M .02	M .02	M .10	M .02	M .10	M .02	M .02	M .02
Girls $E_{14} - M_{14}$	E .02	M .10	N.S.D.	N.S.D.	N.S.D.	M .02	M .02	M .02	M .02	M .02	M .02	M .02	M .02	M .02	M .02	M .02

M - Significant at the indicated level in favour of Manchester.
E - Significant at the indicated level in favour of Edmonton.
N.S.D. - No significant difference.

samples at the fourteen-year old age level.

There were no significant differences in the mean I.Q. scores of the children in the two groups with the exception of the mean Language I.Q. score for the Edmonton fourteen-year old girls, which was significantly higher on the test used than that of the Manchester fourteen-year old girls.

On the English reading tests, there were no significant differences in the mean achievement scores of the children in the samples from the two cities at either age levels.

Mean scores for the Edmonton children on the *Schonell Spelling Test* tended to be significantly higher than those of the comparable groups of children in the Manchester sample. The usual sex differences in spelling achievement with the girls' mean scores significantly exceeding those of the boys' were maintained for the groups in both cities.

Mean grade scores on the sub-tests of the complete battery of the *California Achievement Tests* were generally significantly higher for the Edmonton children than the Manchester children with the exception of the Arithmetic Fundamentals sub-test. The mean grade scores of the Manchester nine-year old children on this sub-test significantly exceeded those of their Edmonton counterparts.

General significant differences in the mean achievement scores in favour of the Edmonton children for the total groups in the samples from each city were maintained when the sex sub-groups were compared, but tended to disappear when only the achievement of those children in the samples from each city with I.Q. scores above 130 were compared.

A comparison of the variances of the achievement scores, particularly on the complete battery of the California Achievement Tests yielded an almost complete reversal of the trends in the mean scores to be significantly better for the Edmonton children. The variances of the achievement scores for the total groups, and the two sex sub-groups were almost uniformly significantly greater for the Manchester groups than for the Edmonton groups. These facts mean that generally speaking the spread in the achievement scores of the Manchester children was wider than that of the Edmonton children. These trends appear to be further indications that the instructional program in the basic subjects in the Edmonton schools does not encourage wide individual differences in achievement, and that not all of the Edmonton children in the high intellectual ability group are achieving near their maximum capacity.

The conclusions and implications drawn from these findings will be discussed in Chapter V.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

These conclusions are based upon a careful study of the test results as outlined in Chapter IV, and the writer's knowledge (gained from readings, personal experiences and discussions) of the programs of the schools in Manchester and Edmonton.

These conclusions are discussed in terms of their relation to each hypothesis, followed by a discussion of the specific limitations of the findings, and the possible implications of the findings relative to curriculum and teaching and administrative procedures.

HYPOTHESIS I

There are no significant differences between the total mean scores on the complete battery of the California Achievement Tests for the nine-year old group, nor for the fourteen-year old group in either city.

This null hypothesis was not confirmed for the total groups in the samples from the two cities at either age level.

In spite of the fact that the Manchester children had been attending school for a longer period of time, the mean achievement grade scores were significantly higher for the Edmonton children than for the Manchester children for the combined score and for the scores on the six sub-tests on this test battery at both age levels included in the experiment with the exception of the Arithmetic Fundamentals sub-test for the children in the nine-year old group. On this one sub-test, the mean achievement grade score of the Manchester nine-year old children significantly exceeded that of the Edmonton nine-year old group. The fact that Manchester chil-

dren devote more time in their Junior School program to drill periods on the fundamentals of arithmetic has been mentioned in Chapter IV. Perhaps an even more important reason to explain this superiority in the scores of the Manchester children on this one sub-test in the battery is the fact that the more complex steps in the processes of multiplication and division (which are included on this Arithmetic Fundamentals sub-test) are taught to Manchester children before they reach nine years of age, whereas the children in the Edmonton sample, who were just beginning their fourth grade in the Edmonton school curriculum had not yet been introduced to these more complex calculations with the basic arithmetic operations, and therefore a very limited number of the Edmonton nine-year old children attempted the items requiring these more complex manipulations.

Difficulties with the format of this test and the types of items presented have been discussed in Chapter IV as possible reasons for the generally lower performance of the Manchester children than that of the Edmonton children on this test battery. However the differences in the mean achievement grade scores for the two selected national groups on the majority of the sub-tests were so significantly in favour of the Edmonton children that other factors besides test difficulty for the Manchester children appear to be operating. The differences also tended to be more significant at the fourteen-year old age level, and if difficulties connected with the completion of the test form were solely responsible for these differences in the mean achievement grade scores of the two selected national groups, these differences would surely be greater for the children at the younger age level.

It is possible that this test battery is more closely adapted to the Edmonton schools' curriculum with its prescriptive emphasis on a logical sequential development of the content and skills in the three basic subjects, with which this experiment is concerned, and the superior mean achievement grade scores of the Edmonton children would therefore be explained in these terms. It should also be easier to set valid test items on a prescriptive, uniform curriculum similar to that of the Edmonton schools than to set test items on an indefinite curriculum similar to that of the Manchester schools. It should also be emphasized that these evident superior test results for the Edmonton children apply only to the three basic subjects that were tested in this experiment, and not to achievement in the whole school curriculum in either city. The test results might be quite different if general tests of understandings in other content subjects of the school curriculum were administered. Tests of other aspects of achievement (e.g. written language, depth and breadth in vocabulary, and the highest levels of reading comprehension) in the three basic subjects might also give quite different comparative results than those attained in this study.

The selectivity of the Edmonton sample, caused by the differences in the original school populations, from which the samples were drawn, has previously been mentioned as a possible influence on the significant differences in the mean achievement grade scores of the two groups of children in the samples at each age level. This selectivity may have a more serious influence on the achievement grade scores at the fourteen-year old age level (where the differences in the mean scores are greater)

because a higher percentage of the low achievers in the fourteen-year old age-group will have repeated a grade, and hence not be in the population from which the Edmonton sample was taken.

Because of the positive correlation between chronological age and school achievement, the fact that the Edmonton nine-year old children were also significantly older (the difference in the mean chronological age for the two groups was two months) than those in the comparable Manchester group may also have had an effect on the differences in the achievement scores for the three basic subjects for the two selected groups at this age level.

The superiority of the Language I.Q. scores of the Edmonton fourteen-year old girls (the difference in the mean I.Q. scores for the two groups was 5 I.Q. points) must also be considered when interpreting the differences in the mean achievement scores on the reading and language sub-tests for the two selected national groups. It is also true that the mean total I.Q. scores were generally higher for the Edmonton groups than for the Manchester groups, although these differences were not significant at the accepted level, but there were no significant differences in the Non-Language intelligence scores for the two groups.

These results for the reading section of the complete battery of the California Achievement Tests showing superior achievement for the Edmonton children in reading vocabulary and reading comprehension as measured by this test, over the Manchester children at the nine-year old age level, and at the fourteen-year old age level are similar to the findings of Foster's study (11) comparing twelve-year old children in

Christchurch, New Zealand and Edmonton, Alberta. The mean scores of the children in the Edmonton group in her study were significantly higher than those of the Christchurch group on both the reading vocabulary, and the reading comprehension sub-tests of the *California Achievement Tests.*

These findings also contribute additional data in support of Preston's (24) and Scholl's (32) conclusions indicating doubt in connection with the popular belief that the standards of education in Europe far excel those attained on the North-American continent.

The general findings of this study regarding arithmetic do add some support to the findings of Buswell (7), Tracy (40) and Kramer (17) in their studies of the arithmetic achievement of groups of children in different parts of the United States and Europe. These three studies demonstrated the superiority of European school children over children on this continent in knowledge of the fundamentals of arithmetic, and the results of the present study reflected a similar superiority for the Manchester children, over the Edmonton children at the nine-year old age level. This superiority was not maintained for the children in the fourteen-year old group. None of the previous studies have tested children at this older age level. A very recent comparative study in arithmetic, by Black and Foster, (1) following up Foster's study (11) in reading with the Christchurch, New Zealand children has demonstrated superiority of the Edmonton children over the Christchurch children on the arithmetic sub-tests of the *California Achievement Tests*, as well as on the reading sub-tests.

The findings of this thesis, showing superiority of the Edmonton

children over the Manchester children on the Arithmetic Reasoning sub-test at both age levels are not completely in agreement with the findings of the previous American-European comparative studies, which have shown uniform superiority for the European children over the children on this continent for all of the arithmetic skills tested. However Tracy's results (40) did indicate a lower difference in the mean scores for the two groups on the arithmetic concept mastery tests, than on the arithmetic fundamentals tests.

No advance hypothesis regarding the variances of the achievement grade scores for the two selected national groups on this test battery was made in this experiment. However, an interesting result was that the variances of the achievement grade scores for the combined score on the California Achievement Tests and for the scores on the six sub-tests were significantly higher for the Manchester children in the test sample at both age levels than for the comparable Edmonton children.

This result suggests that although the mean performance of the Edmonton children on this test battery exceeds that of their Manchester counterparts, the performances of the Manchester children were spread over a much wider range than those of the Edmonton children.

There is no official program of instruction in the Manchester schools, and from the time that a child begins school, the Head teacher, and the assistant teachers do what seems best, and adjust themselves to the children's needs as much as possible. Many observers have indicated that English teachers and headteachers have more freedom to make such adjustments in their programs than the teachers of any other country.

This high degree of individual autonomy for each headmaster and teacher has a great effect on curriculum, methods and materials in the school program and must be recognized in any comparative study. It seems fairly apparent that this type of program would increase the range in the children's school achievement record significantly more than the organized prescriptive curriculum for all students that exists in the Edmonton schools, but it is also apparent that it is very difficult to administer an accurate test of the results from such a form of education.

Foster's study (11) of the reading achievement of Christchurch and Edmonton children showed no significant differences in the variances of the reading scores on the California Achievement Tests.

HYPOTHESIS II

There are no significant differences between the mean scores on the Watts Sentence Reading Test (for the nine-year old group) and the Vernon Sentence Reading Test (for the fourteen-year old group) for the comparable groups in either city.

Experience in educational measurement has shown that different standardized tests of achievement in the basic subjects often produce different test results for the same children in the same city. This problem of a lack of correlation between test scores, and the identification of the best tests for the measurement of achievement in the basic subjects is particularly important to the success of the educational research, when selected groups in two different countries are being compared. It was therefore necessary in this study to use achievement tests that had been published and standardized on both sides of the Atlantic in order to investigate the problem of whether there is equality

of achievement in reading between the two selected national groups, when reading tests standardized in England are used, as well as when reading tests standardized on the North American continent are administered.

That no significant differences in the mean reading scores of the two selected national groups on either of the two English reading tests of comprehension ability existed was confirmed from the test results in this experiment. There was apparent equality of achievement in reading, as tested by these tests between the two groups selected for this experiment.

Both of these tests provide a sample of the reading ability of the children on a completion type test of reading comprehension in a fifteen-minutes time period.

The reading sub-tests of the California battery sample a much wider range of reading ability in a longer time interval. A total of forty-eight minutes of testing time is needed for the Elementary form of the California Reading Test, and this amount of time is increased to sixty-six minutes on the Junior High school form of the same test.

It is possible that the apparent equality of achievement in reading for the two selected national groups on the Watts Sentence Reading Test, and the Vernon Sentence Reading Test is due to the limited sampling of reading skills on both tests, and the limited number of items used. However it should also be emphasized that length of test bears little relationship to test validity and reliability. These two sentence reading tests appear to be less closely related to any definite school curriculum, and may therefore provide the best unbiased score for reading

ability for both of the two selected national groups. It should be restated that the mean scores for the Manchester children on these tests were not significantly below the mean scores of the Edmonton children at either age level, while on both of the reading sub-tests of the California Achievement Tests the mean scores of the Edmonton children significantly exceeded those of their Manchester counterparts at both age levels.

These conflicting results for two different national tests in reading illustrate one of the main problems in international comparisons of educational achievement, i.e. the problem of identifying and obtaining valid achievement tests for both of the selected national groups.

In the previous comparative achievement studies in reading discussed in Chapter II, none of the reading tests used in the English-American comparisons originated in England. Scholl's study (32) did attempt to make some provision for the "American English" used on the test by substituting single words where meanings or spelling differed in the two countries, but the test results showed no significant differences in the test results for the English children on the adapted, or the unadapted form.

Preston's study (24) used a reading test that had been standardized in Germany, in addition to the _Gates Reading Survey_ in his German-American comparison of reading achievement. The mean scores for the American children in his sample tended to be significantly higher than those of the German children on both of the reading comprehension tests, but this study has one basic difference from the research study with which this thesis is concerned. The _Frankfurter Test_ had to be translated into

English for the American children, and the Gates Reading Survey had to be translated into German for the children in Germany. The relative test difficulty of both of the reading tests might have been adversely affected by these translations. Since English is the native language for both the Manchester and Edmonton children included in this experiment, no such test translation was necessary to allow for the use of standardized tests from both countries in the testing program.

HYPOTHESIS III

There are no significant differences in the spelling scores on the Schonell Spelling Test for the nine-year old group, nor for the fourteen-year old group in the samples from the two cities.

This null hypothesis was not confirmed for the children in the nine-year old group, nor for the children in the fourteen-year old group in the samples from the two cities. The mean scores for the Edmonton children in the samples at both age levels were significantly higher than those of the Manchester children. The variances of the spelling scores at both age levels were significantly higher for the Manchester children than for the Edmonton children.

Although this test was published and standardized in England, it has been used extensively on this continent, and its norms appear to be appropriate for children in both of the selected national groups of this experiment. Raw scores were used for comparison purposes in this experiment. Its form of administration should have presented no difficulties to the children in either of the two samples, and the significant differences in the scores obtained by the two groups must be explicable in other terms.

The spelling program, prescribed by the Alberta Department of Education for the first eight grades in the Edmonton Schools contains specific spelling words to be studied each week by all the children at certain grade levels. Definite spelling exercises and activities are also included in the authorized textbooks for each day of the week for all of the children. The Manchester spelling program is almost a complete opposite. When asked about the curriculum in spelling for the children in her school, the headmistress in one of the schools from which the Manchester sample of children was taken replied that "spelling lessons are taken when required . . . also spellings are corrected in English."

It seems fair to conclude from the results of this experiment that the prescriptive program in spelling for the Edmonton schools provides a higher average performance rate in the ability to spell words correctly on a standardized spelling dictation test, than the incidental spelling program of the Manchester schools. However no comparison of the spelling errors made by children in free writing in the two selected national groups was made in this experiment. Such a comparison might produce very different significant results from those on the scores for the Schonell Spelling Test.

It also seems fair to conclude from the significant differences in the variances of the spelling scores for the two groups that the uniform program in spelling for all children in the Edmonton spelling may inhibit the spelling progress of some of the abler students, and decrease the range in the spelling achievement of the Edmonton children.

HYPOTHESIS IV

There are no significant differences in the achievement scores on any of the tests administered to the matched groups in either city when the sex factor is considered.

Because of the influence of sex differences on school achievement, particularly in the Language Arts on this continent, it was considered important in this study to identify any differences in achievement in the three basic subjects for like groups in the two selected national samples.

GIRLS: That no significant differences in the achievement scores of the girls in the two cities' samples existed was confirmed for the test results on the Watts Sentence Reading Test, and on the Vernon Sentence Reading Test, but not for the test results on the Schonell Spelling Test, and on the complete battery of the California Achievement Tests.

The mean achievement grade scores on the sub-tests of the California Achievement Tests were significantly higher for the Edmonton girls than for the Manchester girls at both age levels with the exception of the sub-test on Arithmetic Fundamentals. The mean achievement grade score for the Manchester nine-year old girls was significantly higher than that of the Edmonton nine-year old girls on this one sub-test. These results are identical to those for the total groups in the sample at each age level.

The mean spelling grade scores of the Edmonton girls at both age levels on the Schonell Spelling Test were significantly higher than those of the Manchester girls. Again these significant differences were identical to those for the total groups in the samples from both cities.

The significant differences in the variances of the scores for the

girls only on the above tests were also similar to those for the total groups.

The fact that the fourteen-year old girls in the Edmonton sample scored significantly higher than the Manchester girls of the same age on the Language section of the *California Short-Form Test of Mental Maturity* may have had an effect on the achievement scores for the girls at this age level. If the difference in the Language I.Q. scores is a true one, the Edmonton girls could logically be expected to score significantly higher on the reading and language achievement tests in the battery of tests administered.

BOYS: That no significant differences in the achievement scores of the matched groups of boys in the two cities existed was confirmed for the test scores on the *Watts Sentence Reading Test*, and on the *Vernon Sentence Reading Test* at the two age levels. It was also true for the scores on the *Schonell Spelling Test*, and the sub-tests on Arithmetic Fundamentals and Spelling of the complete battery of the *California Achievement Tests* at the nine-year old age level, but not at the fourteen-year old age level. On the other sub-tests of the *California Achievement Tests* at the nine-year old age level, and on all of the sub-tests at the fourteen-year old age level, the mean scores of the Edmonton boys were significantly higher than those of the Manchester boys, and these findings relative to the mean scores and the variances of the scores were comparable to the total groups in the samples at the older age level.

On the basis of the tests administered, complete equality of

achievement in the basic subjects between the two selected national groups, when the two groups were sub-divided, and the sex factor was considered, was therefore not indicated in the test results of this experiment.

Preston's study (24) involving fourth and sixth grade pupils in Wiesbaden, Germany and Philadelphia, U.S.A. also investigated the question of the sex factor and school achievement. His interesting findings that the indicated superiority of American girls over American boys in reading achievement was reversed in the German sample (i.e. the German boys were superior to the German girls) was not repeated in this English-Canadian study.

HYPOTHESIS V

There are no significant differences in the achievement scores on any of the tests administered to the matched groups in either city, when higher levels of intelligence are considered.

Because of the very specialized provision for intellectually-gifted children in Manchester, particularly after the taking of the "eleven plus" examination, this hypothesis involving the comparison of school achievement scores for children with I.Q. scores above 130 in the two cities' samples was an important one in this experiment.

It was confirmed for those nine-year old children in the two samples with I.Q. scores above 130 on the California Short-Form Test of Mental Maturity for the Schonell Spelling Test scores, and for the results on the complete battery score of the California Achievement Test. It also held true for the Reading Vocabulary, Reading Comprehension, Arithmetic Reasoning, and Spelling sub-tests of the complete battery.

It did not hold true for the Arithmetic Fundamentals sub-test, where the scores of the Manchester nine-year old children were significantly higher than those of the comparable Edmonton children, nor for the Mechanics of English sub-test, on which the scores of the Edmonton nine-year old children were significantly higher than those of the comparable Manchester group.

This null hypothesis was also not confirmed for the Watts Sentence Reading Test, on which the scores of the Manchester nine-year old children in this sub-group were significantly higher than those of the comparable Edmonton nine-year old children.

It seems fairly evident then, that on the basis of this testing program, there is not equality of achievement in some aspects of the three basic subjects between the two selected national groups at the nine-year old age level when higher levels of intelligence are considered.

As has already been indicated a very small number of children with I.Q. scores above 130 were identified in the fourteen-year old samples from the two cities. When the scores for the two small groups were compared by use of the non-parametric Mann Whitney U test (35), no significant differences in the achievement scores for the two groups were revealed. Apparent equality of achievement in the skills and attained knowledge of the basic subjects tested by the chosen tests between the two selected national groups at the fourteen-year old age level in the intellectually-gifted group was the result when this very small sample of children was compared.

None of the previous comparative achievement studies located in

the literature have compared standards of school achievement in relation to higher levels of intelligence in two different countries. Buswell's study (7) in arithmetic revealed a very small number of pupils in the California sample reached the high arithmetic accomplishment of the top third of the English sample. However, this high level of arithmetic achievement for the English children on Buswell's arithmetic test was not related to levels of intelligence.

It may be tentatively concluded from the results of this current study that the measured superiority of the Edmonton children over the Manchester children in their achievement in the three basic subjects on five of the six sub-tests in the complete battery of the _California Achievement Tests_, and on the _Schonell Spelling Test_ is not maintained when higher levels of intelligence are considered, and only those children with total I.Q. scores above 130 are compared.

LIMITATIONS OF THE FINDINGS

The conclusions drawn from this comparative study of achievement in the three basic subjects of children in Manchester, England, and children in Edmonton, Alberta at two different age levels of the school system must be interpreted in terms of certain limitations.

1. This experiment was confined to one English and one Canadian city, and therefore obviously may not be representative of the two selected countries as a whole. The general conclusions in this experiment are therefore limited by the representativeness of the chosen samples in each city of the two selected nations as a whole.

2. The data obtained, and the size of the sample from each city were too limited for the significant differences in the school achievement scores to form the basis for highly accurate predictions. However, the findings do indicate trends, and might well form the basis for further hypotheses in the field of comparative achievement research.
3. The test results had to be interpreted in terms of the particular battery of tests used in the experiment, and it is possible that the findings might not have been the same if a different battery of tests had been used. It seems fairly evident that a true basis for the testing of comparative education achievement in different countries has yet to be discovered, and there are obviously many dangers inherent in generalizing from the results of this experiment to general statements about education in England and Canada as a whole.
4. The selectivity of the Edmonton sample due to the fact that not all of the nine-year old children, and the fourteen-year old children had been promoted to the fourth and ninth grades, and were therefore not in that section of the Edmonton school population, from which the sample was drawn, places a further limitation on the findings of this experiment.
5. The significant difference in the mean chronological age, and the variance of the ages of the nine-year old children in the two samples, and the significant difference in the mean Language I.Q. scores of the fourteen-year old girls in the samples from the two cities indicate an additional limitation on the achievement score differences.

6. The very small number of children identified in the intellectually-gifted group of the fourteen-year old sample from each city, must also be accepted as a limitation on the findings for those two subgroups in the study.
7. Although children in the samples in both cities were tested during their fourth and ninth years at school respectively, the testing periods relative to position in the school term were not identical for the two cities' samples. The Manchester children were tested very near the end of their school term; the Edmonton children were tested near the beginning of their school term. Any effect that the passage of a school year might have on children's achievement in the basic subjects, relative to motivation, mental set, etc. must be recognized as a limitation on the findings.

IMPLICATIONS

In spite of the limitations that have been outlined, the conclusions drawn from the comparative study of the achievement in the three basic subjects of children in Manchester, England and children in Edmonton, Alberta at two different age levels of the school system do suggest certain implications.

Curriculum and Teaching Procedures:

The organized prescriptive program of instruction of the Edmonton schools authorized and controlled by the Alberta Department of Education seems to produce a higher average performance rating in the three basic subjects for the majority of the students than the much freer, indefinite

program of instruction of the Manchester schools. However the flexible curriculum and methods of instruction of the Manchester schools seems to widen the range of the pupils' achievement in the basic subjects significantly more than the instructional program provided for the school population of Edmonton. It would seem that the basic differences in the curriculum of the schools in the two selected cities must be mainly responsible for these significant differences in the achievement scores as teaching methods often tend to be similar and teachers in both cities possess the same freedom to vary their teaching methods to fit the individual needs of the children in their particular classes.

These results present fundamental general questions to all educators concerned with any aspect of curriculum construction for the schools in either of the two selected countries. Is it possible to provide a school curriculum that will maintain high average performance ratings in the three basic subjects, and at the same time provide many additional opportunities for children to achieve to their maximum capacity in all aspects of the schools' program? Can official direction in matters of curriculum from centralized educational authorities produce uniform higher achievement in the basic subjects without sacrificing the provisions for individual students to proceed through the school program at their own rate?

Obviously, curriculum and teaching procedures have a marked influence on achievement in the three basic subjects tested in this experiment, and attempts to answer these questions, arising out of the test results for both of the selected national groups, need to be made.

Age of School Entry:

The one year earlier starting age for most Manchester children as compared to the Edmonton starting age does not seem to be an advantage in the acquisition of skills and knowledge in the three basic subjects tested by the chosen battery of tests in this experiment. The Manchester children were completing their fourth and ninth years at school: the Edmonton children were just beginning their fourth and ninth years. Yet the mean scores of the Edmonton children on the majority of the tests administered tended to excel those of their Manchester counterparts, indicating a general superiority of achievement in the three basic subjects for the children in the Edmonton sample. This finding belies the common belief regarding the superiority of European education, particularly those advocates of this belief who stress the value of the extra year in school at an early age, which is more common for European children than for children on the North-American continent.

However, it does not seem fair to dismiss the importance of a planned program of learning experiences for children of chronological age five years, simply on the basis that such a program does not produce significant differences in measured achievement in the basic subjects at nine and fourteen years of age. Recent studies in child development have confirmed the importance of the readiness activities before the introduction of the abstract knowledge of the schools' program and the importance of the provision of these readiness activities in an organized kindergarten program.

However, fundamental educational issues remain to be settled.

Would the general learning and development of children throughout the schools' program be improved by a definite provision for regular school attendance for all children at five years of age? Having answered this fundamental question, curriculum makers must then decide on the best method of using the child's first year at school. What types of experiences will best promote the later development of the skills, abilities, attitudes and appreciations that are the desirable outcomes of the total educational program provided by the schools?

Answers to these questions arising from the results of this experiment, and relative to the optimum age for entry into the schools' programs are important. Some obvious influence on school achievement in the three basic subjects should accrue from one extra year at school if this extra year were used in the most effective possible manner, and other important objectives of the total educational program should also be attained.

Streaming:

The provision for the "streaming" of all children into separate classes, with differentiated programs of instruction according to their achievement and intellectual ability, that is common practice in Manchester schools appears to widen the range of individual differences in achievement in the three basic subjects measured in this experiment. The Continuous Progress System in Edmonton, in which all the children in the Edmonton sample at the nine-year old level were enrolled cannot be completely equated with such "streaming" procedures. It provides for the more able children to complete the prescribed program at a faster rate,

and for some children to move through the prescribed program at a slower rate than the "average" children and thus differentiates the prescribed program according to rate of progress for some students. The "streaming" procedures used in Manchester schools are not concerned with any prescribed program. The program provided in each of the "streamed" classrooms may be very different at each level from that of other children of the same chronological age in another "streamed" classroom. These differences may apply not only to the basic curriculum content for the "streamed" classes, but also to teaching methods and materials used with the different classes.

The fundamental educational issue that seems apparent from the results of this study, indicating a wider variation in the achievement scores of the Manchester children than those of the Edmonton children is the need for further investigation into the best administrative procedures for providing for real differentiation of the instructional program according to the abilities of the children in the schools without sacrificing a high level of general, or uniform achievement. Further investigations into differentiation of the teaching methods and materials used with different groups of children, as well as differentiation of the basic curriculum content are needed in both of the selected countries.

Intellectually-Gifted Children:

Since this group of children in Manchester are segregated into the "A" classes in the Junior Schools, and after being successful on the "eleven plus" examination are placed in the Grammar Schools, where they receive an advanced academic program, a high level of academic

performance can be expected from them.

The Edmonton plan provides for very little differentiated instruction for the intellectually-gifted child. From the findings of this study the program of instruction in the Edmonton schools does not appear to meet the needs of the intellectually-gifted children as satisfactorily as it meets the needs of other students in the general school population. The children with "average" and "below average" intellectual ability in Edmonton schools achieved at a significantly higher level of attainment in the basic subjects than the comparable children in Manchester. However, pupils with "above average" intellectual ability in the Edmonton schools achieved in the basic subjects at a level equal to (and below on some tests) the comparable Manchester children.

It is the results of this experiment indicating insufficient challenge to the intellectually-gifted students in the Edmonton sample at both age levels that should cause considerable concern to the educators on the North American continent.

General questions in this area with which educators in both of the selected countries are faced include the following: What additional provisions should be made in the program to meet the educational needs of intellectually-gifted children? Is it possible to meet these needs within the regular school program provided for all students, or is it necessary to segregate this particular group of children into a completely separate school organization, in order to provide them with the best type of school program to ensure their maximum educational development?

In view of the fact that administrative provisions and the designated curriculum for intellectually-gifted children exert an influence on the achievement of these children in the three basic subjects, continued investigations relative to the solutions for these problems are needed.

Books and Other Teaching Materials:

Teachers in Edmonton schools must use certain prescribed textbooks for a particular grade as the basis of their instructional program, while teachers in Manchester schools are completely free to choose any of the wide variety of teaching aids available according to their suitability for the particular class. However, for economic reasons, chosen textbooks must be used for a relatively long period of time in Manchester classrooms. This factor limits the obvious flexibility in teaching materials used, in spite of the freedom of each individual school to choose its own textbooks, and other teaching aids. The Manchester procedure seems to make it considerably easier for teachers or children with special abilities or interests to use these attributes beneficially in the school program. It would be very difficult to test objectively the results of this educational freedom on the total educational development of the children.

However, since the results of this study show an almost uniform wider range in the achievement at both age levels of the Manchester children than the Edmonton children the influence of the use of compulsory authorized textbooks in the three basic subjects on maintaining a greater degree of uniformity for the achievement scores of children in such a prescriptive program should be investigated. Is it possible to maintain

a high mean performance in the basic subjects without restricting the core of the curriculum in the three basic subjects to definite authorized textbooks? If teachers are completely free to use any available books, or sections from a number of different books as the core of their instructional program in the three basic subjects, is the resulting program more likely to increase the opportunities for all students to progress at their own individual rate, while still maintaining the high average achievement scores for all students? What influence does more official direction in the choice of textbooks and other teaching materials have on increasing general achievement in the three basic subjects, while at the same time safeguarding the opportunities for a freer choice of textbooks and teaching aids for children at both of the extreme ends of the children's intellectual ability scale? If selected groups of educators are taking responsibility for the choice of key textbooks, and other teaching materials to be used as the core of the curriculum content, what background should these people have? What criteria should they use in selecting the books? What specific uses of textbooks in the schools' program should be considered in making the choice?

The books and other teaching materials used in any school program obviously appear to have a considerable influence on the achievement in the three basic subjects of the children in the program. It is therefore important that answers to the above questions be sought by educators in both of the countries selected for this study in order to improve the instructional program in their schools.

The problem of children transferring from one school to another

while in the midst of their school program has often been given as a basic reason for the necessity of having a limited number of authorized textbooks in Alberta schools. The mobility of the Edmonton population is certainly greater than that of the Manchester population, and this reason is therefore more worthy of consideration in Edmonton than in Manchester. However, if the transfer from school to school of a limited number of students in any one year results in all the students in the Edmonton school population being subjected to a "lock-step" curriculum, partly resulting from the use of prescribed textbooks, a re-examination of this prescription is doubly necessary.

SUGGESTIONS FOR FURTHER RESEARCH

The whole field of comparative education achievement testing is relatively new. The completion of this study has indicated other studies which would be both interesting and beneficial to the general field of comparative education, and to the improvement of our own educational program in particular.

Some experiments, which might arise out of this study are:

1. Experiments to determine whether the differences in intelligence resulting from this experiment with the two selected national groups are maintained when recently developed "culture-free" tests of intelligence are used with children in different geographical regions of the two countries selected.
2. Experiments to determine whether the significant differences in achievement resulting from this experiment with the two selected

national groups are maintained when other standardized achievement test batteries are used with children in different geographical regions of the two countries selected. Even more interesting might be a comparative study using specially constructed tests designed to be equally applicable to the school curriculums in both of the selected countries.

3. Experiments to compare the performances of children in the two selected countries in aspects of the schools' program not tested in this study. Particularly interesting would be comparative studies of the relative facility in the oral and written use of language, and the "ingenuity" of groups of children at different age levels from the two selected countries.
4. Experiments to compare the short-term and the long-term effects in a number of areas of the school curriculum of the additional year of public school attendance that is provided for English children, and not for Alberta children at five years of age.
5. Experiments to compare the relative attainment in all aspects of the schools' programs for the intellectually-gifted groups in the two selected countries.
6. Experiments to compare the achievement of children in all subjects and activities that comprise the schools' curriculum at a number of different age levels, and at a number of different intelligence levels in a number of different countries. Particularly relevant would be a study of the comparative mathematics performance of children in Europe, and children on the North American continent at the

teen-age level.

7. An experiment to determine whether differences in the results of comparative research are obtained when two different methods of selecting the equivalent groups in each country are used, i.e. (a) when individual students are matched for the three variables of sex, chronological age, and non-verbal I.Q., or (b) when means and variances of the chronological ages, and the non-verbal I.Q. scores are calculated to be not significantly different for the two selected national groups.
8. Experiments to determine the comparative effectiveness of a number of the available test batteries currently on the market in assessing the abilities and achievement of children at different age levels in different English-speaking countries.
9. An experiment to determine the relative effectiveness of the school reading programs in Manchester, and in Edmonton on the promotion of continued reading interests in adult life.

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APPENDIX

SCHONELL GRADED WORD SPELLING TEST A

net	can	fun	top	rag
sat	hit	lid	cap	had
let	doll	bell	yes	then
may	tree	by	ill	egg
land	how	your	cold	talk
flower	son	seem	four	loud
ground	lowest	folk	write	amount
noise	remain	hoped	worry	dancing
damage	else	through	entered	cough
fitted	spare	daughter	edge	search
concert	domestic	topic	method	freeze
avoid	duties	recent	type	instance
liquid	assist	readily	guess	attendance
description	welfare	various	genuine	interfere
accordance	mechanical	anxious	signature	allotment
approval	accomplished	remittance	financial	capacity
surplus	exceptionally	successful	preliminary	resource
prologue	colonel	coarse	referring	courteous
exhibition	affectionately	attorney	pinnacle	toboggan
definite	guarantee	anniversary	paraffin	accommodate

CG

WATTS SENTENCE READING TEST 1

NAME ______________________________ AGE __________ years ____________ months

SCHOOL ______________________________ DATE ______________________________

EXAMPLES: TOM PUT HIS HAT (AS, AT, ON, IN).
MY DOG CAN (TALK, SING, FLY, BARK, DRAW).

1. Come with me to the shops to buy some (fire, water, stone, sweets, motors).

2. It is a nice warm day. I will open the (door, bag, sack, road, box).

3. I had a lovely ride on the front seat of a (bath, booth, both, bus, bush).

4. All cats have four (eyes, toes, legs, ears, tails).

5. I should like a holiday at the seaside where I could play in the (lake, sand, road, river, hills).

6. The man who makes bread is called a (master, sailor, baker, farmer, shopman).

7. Why not use this piece of string for wrapping round the (world, town, shop, parcel, house)?

8. The engine driver and the guard left the train on reaching the (door, hill, farm, station, street).

9. My uncle is very clever: he works magic and makes us (laugh, angry, hungry, succeed, fail).

10. A place from which books may be borrowed for reading is called a (laboratory, library, lounge, office, church).

11. Do you know where to buy tea and sugar? Yes, at the (butcher's, draper's, milliner's, grocer's tailor's).

12. Television cannot be enjoyed by people who are unable to (see, touch, smell, stand, sing).

13. In the autumn the orchard boughs are usually loaded with (apples, corn, peas, potatoes, roses).

14. John made many journeys into foreign countries and brought back several curious (objects, topics, projects, abstracts, luggage).

15. Jane was made responsible for answering telephone inquires on account of her pleasant voice and good (complexion, handwriting, appearance, typing, manners).

16. My brother was sent on an errand to the chemist's to get some (toothache, petrol, cigars, papers, ointment).

17. Fatigue and anxiety had made the old lady seriously (alert, sorry, quick, ill, simple).

18. The cathedral occupied a prominent position in the centre of the (village, city, traffic, congregation, stream).

19. Physical exercise will give you a good appetite and keep you (sunburnt, complete, safe, wealthy, healthy).

20. The nation expects both adults and children to look right and left in crossing (fields, oceans, rivers, thoroughfares, plains).

21. Refrigerators perserve foodstuffs from becoming (frosty, rusty, cold, chilly, mouldy).

22. I could hardly make out what had been inscribed in the centre of the circle: it was so (plain, clear, distinct, faint, invisible).

23. John is an ambitious young musician who is determined to (exceed, intercede, proceed, recede, succeed).

24. Several cylinders of oxygen were used by the anaesthetist during the (operation, co-operation, presentation, calculation, enumeration).

25. The electrical disturbances in the atmosphere produced lightning accompanied by (fear, thunder, flashes, darkness, illumination).

26. A scientist is a person who tries to find out what is true by conducting (programmes, weights, test-tubes, experiments, electricity).

27. An exhaustive search was instituted for the recovery of the missing (antecedents, reservoirs, documents, buildings, rivers).

28. The medical consultants are responsible for the clinical care of (papers, patients, pillows, possibilities, thermometers).

29. Inexperienced people are not usually noted for their patience in time of (progress, certainty, difficulty, security, eccentricity).

30. The solicitor required a small fee for his services: this was (reasonable, excepted, unsafe, equality, plaintive).

31. The secretary felt obliged to resign from his office and his resignation was therefore (acceded, affected, accepted, adjudged, ascertained).

32. The balance between ordinary visible exports and imports has fared worse than figures might (initial, inlay, inscribe, insinuate, indicate).

33. The scribe had invariably abbreviated the words containing more than three (chapters, verses, paragraphs, titles, syllables).

34. The Colonial Secretary's analysis of events culminating in the suspension of the Constitution was not seriously (exceeded, synthesised, paralleled, challenged, cheered).

35. The political dangers of monopoly seem to have been much (exasperated, excised, exaggerated, expropriated, expostulated).

VERNON READING TEST B. (See Instructions)

NAME ______________________________ AGE __________ yrs. ____________ mths.

SCHOOL ______________________________ DATE ______________________________

EXAMPLES: THE SUN SHINES IN THE (CLOUDS, NIGHT, SKY, RIVER, WEEK).
WINDOWS ARE MADE OF (WOOD, METAL, OPEN, SHUT, GLASS).

1. Ducks swim in a (bucket, pond, yard, cage, garden).

2. Cooking is usually done in the (bedroom parlour, fire, kitchen, street).

3. As one of the drain pipes had burst, the occupants of the flat sent for the (landlord, plumber, charwoman, housewife, bucket).

4. A burglary should be reported to the (friends, school, home, office, police).

5. A salesgirl works in a (hospital, factory, shop, garden, house).

6. Tom and Joan are happy. In two weeks' time school will stop, and they will go away for their (home, teacher, holidays, fun, seaside).

7. He was the kindest man in town; he never tired of (seeing, dressing, giving, helping, doing) others.

8. The head master was held responsible for the discipline and general behaviour of the boys in his (class, school, town, street, family).

9. Mrs. Jones packed her husband's suits, shirts, ties and other necessary articles of (clothing, toilet, travel, socks, food) into the suitcase.

10. He settled down to an evening of mystery and thrilling adventure with a (new, library, love, humorous, detective) story.

11. Farmers who till the fields or feed their sheep and cattle do not live in towns. They are (homely, dull, country, nice, fat)folk.

12. To trap a wild animal, some hunters make a big hole in the earth and cover it with branches and leaves. As the animal cannot see its (life, hunter, bottom, danger, path), it falls in.

13. The bare trees made a lacy pattern against the (summer, empty, wide, blue, wintry) sky.

14. In spite of her intensive slimming her weight did not seem to (show, increase, slim, decrease, grow).

15. When she learnt of her failure in the examination, despite her hard work, the girl was completely (disheartened, exhausted, sick, relieved, rejected).

16. They scanned the "accommodation" column of the advertisement page, in eager search for a (flat, cook, motor car, dog, job).

17. The level of the water was at its highest; after some weeks it began to fall, at first slowly but afterwards quickly. By the end of the month the river was quite (high, wet, wide, low, swift).

18. His parents suspended his monthly allowance in what they considered an effective step to curb his (thrifty, monthly, studious, light, extravagant) habits.

19. The mellow November sun came streaming into the room. The sky was bright and there was a genial (dampness, warmth, breeze, cold, sun) in the air. It was almost like a morning in May.

20. The art student worked hard and scrupulously at his task. Yet he failed to produce a masterpiece for the obvious reason that he had no (paints, duty, need, support, talent).

21. It is not sufficient to know the means of preventing and curing disease; it is equally (bad, necessary, useful, sufficient, good) to provide these means and even to compel their use.

22. The student roamed from library to library in search of the (studies, librarian, professor, library, book) recommended for reading.

23. No film is open to public entertainment until it has been (seen, filmed, distributed, paid for, censored).

24. Considering the great capacity that a human being has for love, it is astounding that the history of mankind should be frequently blackened by deeds of (love, manliness, consideration, hate, history).

25. In the days when people lived in caves and rough shelters, there were no fields or farms; men got their food by hunting animals and by (finding, planting, gathering, growing, eating) berries and wild fruits.

26. The old man walked down into the wine cellar and looked for his cherished bottle of (medicine, lemonade, paraffin, claret, liquid).

27. His long holiday, after the hard work and strain he had been through, made him feel very much (sun-burned, rested, worse, overworked, energetic).

28. However brilliant a student may be, strong emotional disturbances are bound to affect his (results, character, happiness, health,comfort).

29. In a totalitarian state, books and all other forms of printed matter are subjected to Government (censorship, dictatorship, publication, printing, subsidies).

30. No scheme for a change of society can be made to appear immediately palatable, except by falsehood, unless society has become so desperate that it will accept any (lie, help, falsehood, change, politician).

31. Every stockbreeder knows that he can breed sheep for fatness or for length of wool; he can breed horses for strength or for swiftness. He can thus (breed, create, have, change, fix) the size and shape of animals from generation to generation.

32. Few things are more irritating than to be accused to intellectual dishonesty when one is trying hard to fight against (self-improvement, self-deception, cheating, lying, irritation).

33. History has known several cases when a mode of thought has seized the imagination of a vast majority of the intelligentsia, as existentialism has today in France; hence the great (imagination, eagerness, caution, fear, popularity) with which a true philosopher approaches such highly popularised philosophies.

34. To write a successful book requires as much time and energy as to write an unsuccessful one, the difference lying in the fact that the energy in the first case reaps its (success, books, rewards, writing, energy).

35. She hardened herself against any emotional entanglements in an effort to spare herself pain, little realising that pain and hurt are an essential part of full (emotion, living, efforts, enjoyment, hardening).

36. A highly cultured environment often boosts up the academic career of an otherwise (practical, absent, mediocre, brilliant, educated) student.

37. Whilst self-restraint is a praiseworthy quality one should try to cultivate, it runs as much danger of being exaggerated as its (counterpart, equal, quality, virtue, denial) - a free expression to personal feelings and emotion.

38. The boss firmly denied any accusation of discrimination; he claimed that the policies of his firm were not dictated by (prejudice, incrimination, accusations, profits, shareholders).

39. To allow the standards of a new play to be assessed by the Box-Office is as dangerous to art as to insist on the play's high calibre to the complete neglect of (prices, criticism, popular appeal, cinemas, art).

40. True friendship is a relationship so rare that most mortals go through life without realising that so precious and idealistic a (communion, truth, mortality, communication, friendship) between two persons can exist.

41. Despite strong claims to the contrary, no nation colonises another with an altruistic motive, for the very basis of colonization is exploitation, economic or political; to feign (colonial, idealistic, economic, strong, contrary) motives is sheer eye-wash fit for the ignorant.

42. To identify any form of government with Christianity is a dangerous error, for it confounds the permanent with the transitory, the (good, temporary, real, absolute, religious) with the contingent.

Elementary • GRADES 4·5·6·7·8 • 1957 S-Form

California Short-Form Test of Mental Maturity

Devised by

ELIZABETH T. SULLIVAN, WILLIS W. CLARK, AND ERNEST W. TIEGS

E

S-57

INSTRUCTIONS TO PUPILS:

This is a test of mental maturity. In taking it you will show how well you understand relationships and what you do when you face new problems. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

19th Printing

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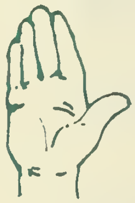
DIRECTIONS: Mark as you are told the letter, R, for each right hand or foot; mark the letter, L, for each left hand or foot.

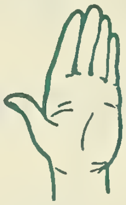
Samples A and B

A



R L

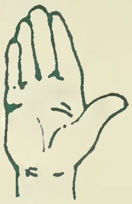
B



R L

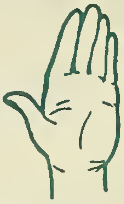
Correct Test Booklet Marks

A



[✓ R] L

B



R [✓ L]

Correct Answer Sheet Marks

	R	L
A	▮	⋮
B	⋮	▮

TEST 1

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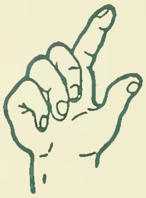

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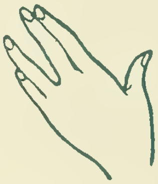

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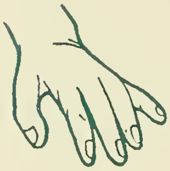

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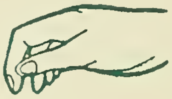

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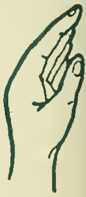

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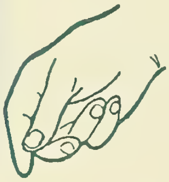

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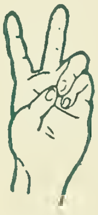

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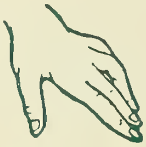

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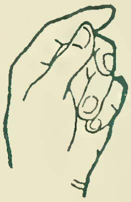

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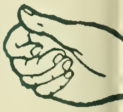

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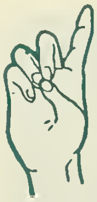

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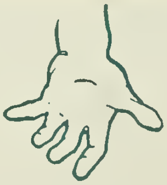

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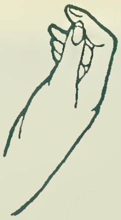

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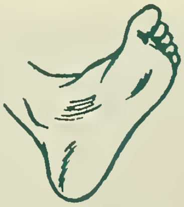

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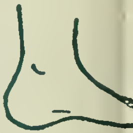

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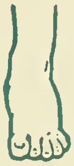

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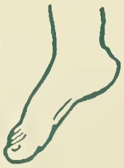

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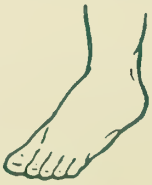

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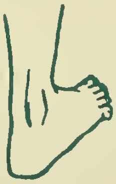

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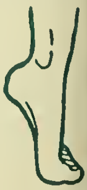


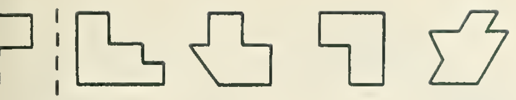
R L

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

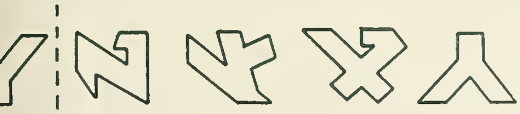
Test 1 Score
(number right)..............................

DIRECTIONS: In each row find the drawing that is a different view of the first drawing. Mark its number as you are told.

TEST 2



1 2 3 4 ____C



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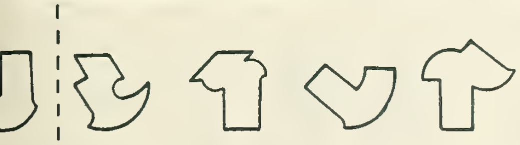

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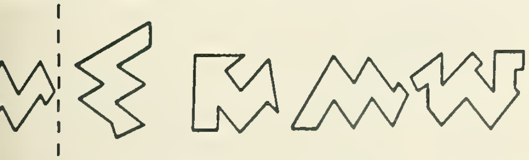

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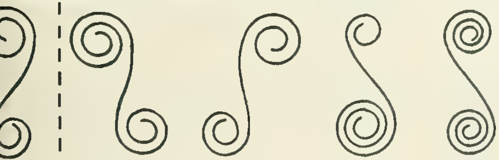

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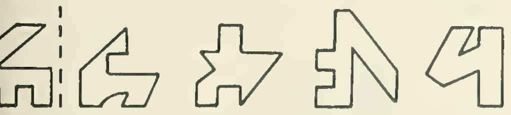

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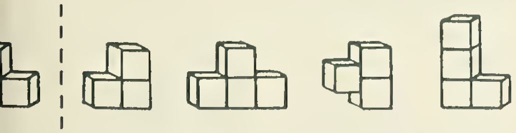

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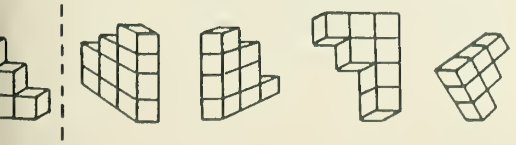

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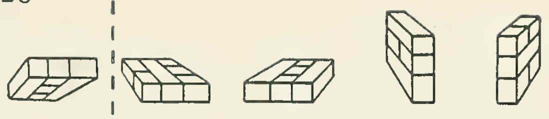

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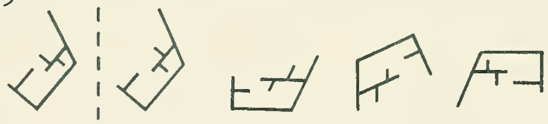
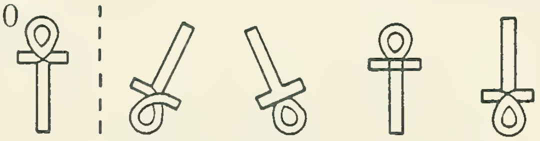


1 2 3 4 ____29

30



1 2 3 4 ____30

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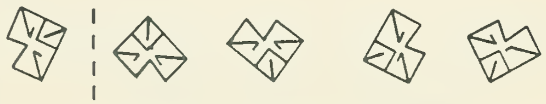

1 2 3 4 ____31

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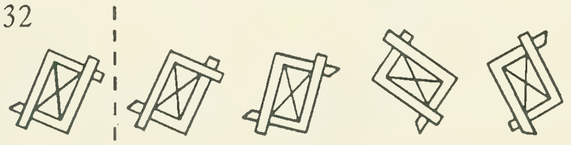

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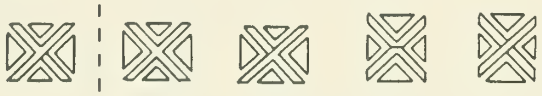
33



1 2 3 4 ____33

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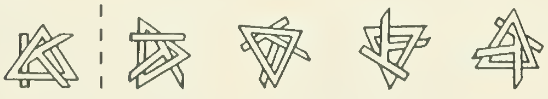
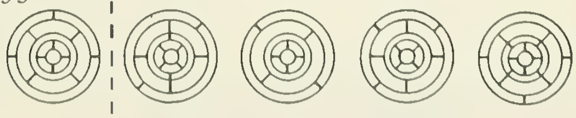


1 2 3 4 ____34

35



1 2 3 4 ____35

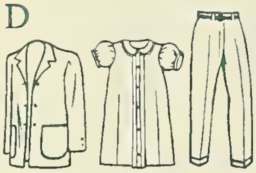
STOP NOW WAIT FOR FURTHER INSTRUCTIONS

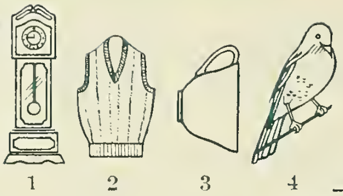
Test 2 Score
(number right).................

DIRECTIONS: The first three pictures in each row are alike in some way. Decide how they are alike, and then find the one picture among the four to the right of the dotted line that is most like them and mark its number.

TEST 3

D





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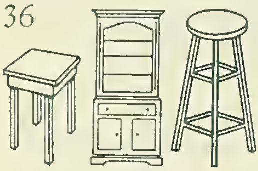
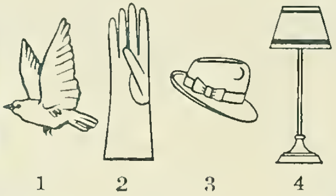
36





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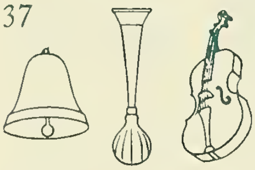

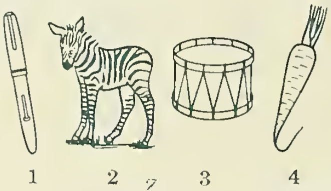

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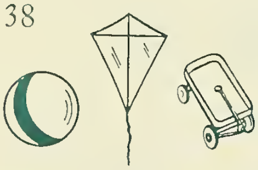

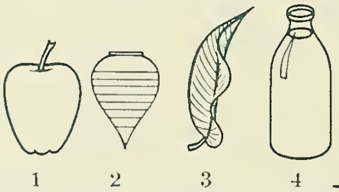

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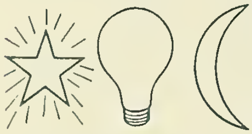

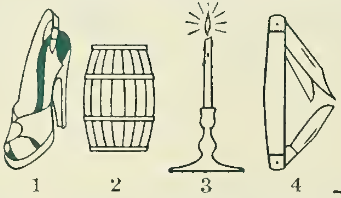

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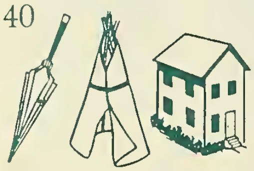

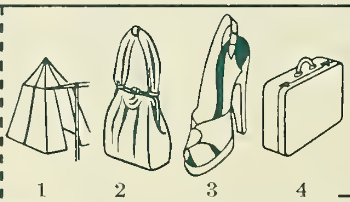

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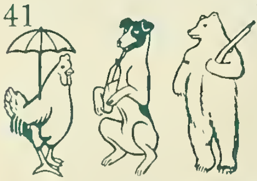

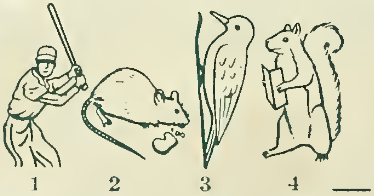

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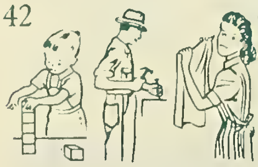

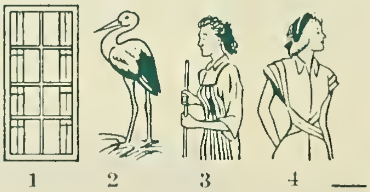

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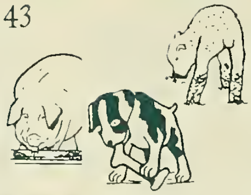

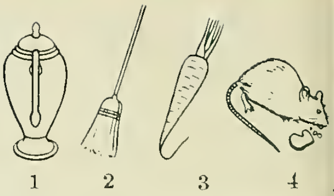

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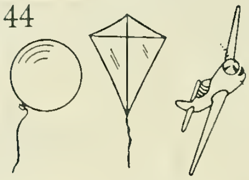

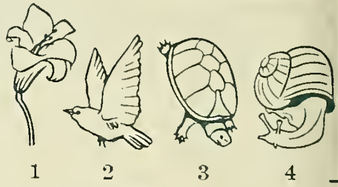

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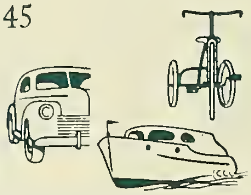

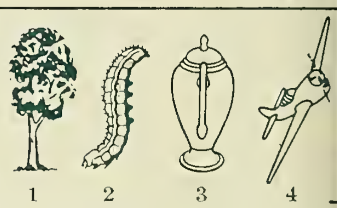

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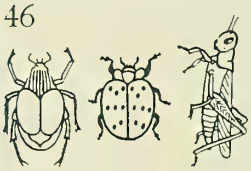

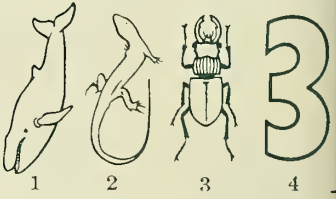

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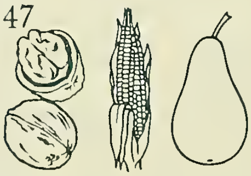

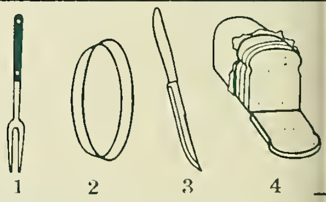

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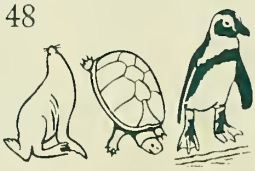

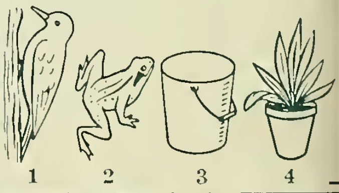

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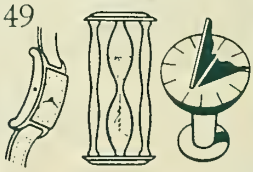

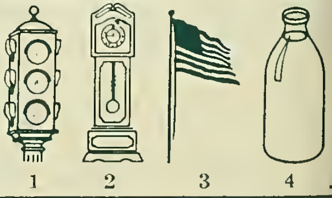

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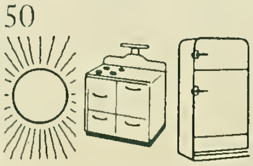
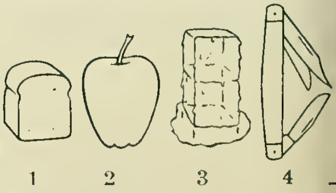




STOP

Test 3 Score
(number right)..........

DIRECTIONS: Read each group of statements below and the conclusions which follow. Then mark as you are told the number of each answer you have decided is correct.

TEST 4

If the sun shines it is day.

The sun shines.

Therefore

[1] It will not rain
[2] It is day
[3] The moon may shine tonight ———E

All four-footed creatures are animals.

All horses are four-footed.

Therefore

[1] Creatures other than horses can walk
[2] All horses can walk
[3] All horses are animals ———51

Either the sun moves around the earth or the earth moves around the sun.

But the sun does not move around the earth.

Therefore

[1] The earth moves around the moon
[2] The earth moves around the sun
[3] The sun is larger than the earth ———52

Jack runs faster than Harry.

Bert runs faster than Harry.

Which is the slowest of the three?

[1] Bert
[2] Jack
[3] Harry ———53

54. Jane is taller than Helen.

Helen is taller than Barbara.

Which is the tallest: Jane, Helen, or Barbara?

[1] Helen
[2] Jane
[3] Barbara ———54

55. All mammals are vertebrates.

The cow is a mammal.

Therefore

[1] Some vertebrates live on land
[2] Some mammals live in water
[3] The cow is a vertebrate ———55

56. A is either B or C.

A is not C.

Therefore

[1] A is not B
[2] A is B
[3] C is B ———56

57. Either your cousin is older than you, or the same age, or younger.

But your cousin is not older, nor is he younger.

Therefore

[1] Your cousin is younger than you
[2] Your cousin is older than you
[3] Your cousin is the same age as you ———57

GO RIGHT ON TO THE NEXT PAGE

TEST 4 (Continued)

58. All circles are round figures.

A certain figure is not round.

Therefore

¹ It is not a circle
² It is oval
³ It is either a square or a triangle ——58

59. At normal temperatures, all metals except mercury are solids.

Gold is a metal.

Therefore

¹ Gold is valuable
² Gold is a solid
³ Metals are usually heavy ——59

60. Some fishes fly.

No birds are fishes.

Therefore

¹ All creatures that fly are fishes or birds
² No fishes resemble birds
³ Creatures other than birds can fly ——60

61. Three boys are up on a ladder.

Tom is farther up the ladder than Paul.

Jim is farther up than Tom.

Which boy is in the middle position on the ladder?

¹ Tom
² Paul
³ Jim ——61

62. George Washington was a skillful general.

George Washington was President of the United States.

Therefore

¹ Skillful generals make good presidents
² One President of the United States was a skillful general
³ Good presidents make skillful generals ——6

63. A is situated to the east of B.

B is situated to the east of C.

Therefore

¹ C is situated close to A
² A is situated to the east of C
³ C is nearer to A than to B ——6

64. He is either honest or dishonest.

But he is not dishonest.

Therefore

¹ He is desirable for a position
² He comes from honest people
³ He is honest ——6

65. A is equal to B.

B is equal to C.

Therefore

¹ B is larger than C
² A is equal to C
³ A is equal to B plus C ——6

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 Score
(number right)..............................

DIRECTIONS: In each row of numbers below, there is one that does not belong. Find the number that should be omitted from each row among the answer numbers on the right, and mark its letter as you are told.

TEST 5

2 4 6 8 9 10 12 14 — a 8 b 9 c 10 d 12 e 14 ______F

). 5 10 15 20 22 25 30 — a 5 b 10 c 15 d 20 e 22 ______66

). 18 15 13 12 9 6 3 — a 15 b 13 c 12 d 9 e 3 ______67

). 2 5 8 10 11 14 17 — a 5 b 8 c 10 d 11 e 17 ______68

). 1 2 4 8 14 16 32 — a 2 b 4 c 8 d 14 e 16 ______69

). 27 9 3 1 0 ⅓ — a 9 b 3 c 1 d 0 e ⅓ ______70

). 3 4 7 8 10 11 12 15 — a 7 b 10 c 11 d 12 e 15 ______71

). 3 9 27 76 81 243 — a 9 b 27 c 76 d 81 e 243 ______72

). 25 24 22 19 18 16 13 12 9 10 7 — a 25 b 22 c 19 d 13 e 9 ______73

). 1 2 4 7 11 15 16 22 29 37 — a 15 b 16 c 22 d 29 e 37 ______74

). 12.5 11.4 10.3 9.8 9.2 8.1 7.0 — a 11.4 b 9.8 c 9.2 d 8.1 e 7.0 ______75

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 5 Score
(number right) ....

DIRECTIONS: Work these problems on a sheet of scratch paper. Mark as you are told the letter of each correct answer.

TEST 6

G. There are 5 birds in a tree and 3 birds on a fence. How many birds are there in both places?

a 2
b 8
c 15
d 7

---

76. Tom has 5 marbles. Bob has 4 marbles. Bill has 3 marbles. How many marbles do all three boys have?

a 1
b 2
c 12
d 60

---

77. Tickets to a show cost 10 cents. Jim bought 2 tickets. How much did he pay for them?

a 20¢
b 2¢
c 12¢
d 8¢

---

78. Ben earns 4 dollars each week helping his father after school. He has earned 16 dollars. How many weeks has he been working?

a 20
b 64
c $4
d 4

---

79. Seventy girl scouts were divided into 5 groups of equal size. How many girls were there in each group?

a 15
b 14
c 20
d 3

---

80. How many marbles can you buy for 25 cents at the rate of 3 for 5 cents?

a 15
b 75
c 33
d 40

---

81. Two boys bought watermelons and sold slices of them at a ball game. They had 50 cents in the cash box to start with. They sold 40 slices of melon at 5 cents a slice. How much should they have in the cash box at the end of the day?

a $2.00
b 80¢
c $3.00
d $2.50

---

82. Balls which usually sold for 65 cents were sold for a short time for 25 cents less. Frank bought a ball at the lower price and gave the clerk 50 cents. How much change should he get back?

a 25¢
b 20¢
c 10¢
d 5¢

GO RIGHT ON TO THE NEXT PAGE

At Camp No. 9 it took 10 boy scouts 3 days to set up camp. Camp No. 12, which is the same size, must be set up in one day. How many boys will be needed to do the work?

a 3
b 30
c 27
d 13 ______83

George lives one-fourth of a mile from school. He goes home at noon for lunch. How far does he walk each day going to and from school?

a ½ mi.
b 1 mi.
c ¾ mi.
d 1½ mi. ______84

A newsboy delivered papers to 30 customers for a month. At the end of the month he collected $15.00. How much did each customer pay?

a 50¢
b $2.00
c 5¢
d $5.00 ______85

There are 20 girls in the Sunday School class. Each week each girl gives 5 cents to go toward a fund for needy families. How much will all the girls give in 5 weeks?

a $1.00
b 25¢
c $5.00
d $7.50 ______86

Richard saw an air rifle advertised for $21.00 at one-third off for cash. How much money will he need to buy it?

a $14.00
b $7.00
c $18.00
d $9.00 ______87

How much will your mother have to pay for the cleaning of a rug 9 ft. wide and 12 ft. long at the rate of 20 cents a square foot?

a $8.40
b $1.08
c $4.20
d $21.60 ______88

In a field meet, 20 events were listed for the day. Pupils from your school won 60 per cent of the events. How many events did you lose?

a 4
b 3
c 8
d 12 ______89

A swimming pool is 60 ft. long and 30 ft. wide. The water in the pool is 4 ft. deep on the average. How long will it take to fill the pool if the water runs in at the rate of 90 cubic feet a minute?

a 80 min.
b 5 min.
c 26 min.
d 45 min. ______90

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 6 Score
(number right)..................................

DIRECTIONS: Mark as you are told the number of the word that means the same or about
the same as the first word.

TEST 7

H. blossom 1 tree 2 vine
3 flower 4 garden ______ H

91. journey 1 state 2 travel
3 end 4 fair ______ 91

92. law 1 rule 2 power
3 able 4 help ______ 92

93. always 1 larger 2 forever
3 know 4 apart ______ 93

94. almost 1 rarely 2 never
3 now 4 nearly ______ 94

95. alarm 1 blame 2 signal
3 address 4 comfort ______ 95

96. damage 1 manage 2 collect
3 injure 4 recover ______ 96

97. announce 1 keep 2 publish
3 reform 4 destroy ______ 97

98. improve 1 make 2 better
3 satisfy 4 admit ______ 98

99. difficult 1 different 2 pleasant
3 hard 4 task ______ 99

100. despair 1 mind 2 time
3 past 4 hopelessness ______100

101. consent 1 occur 2 offer
3 oppose 4 agree ______101

102. portion 1 collect 2 part
3 make 4 refer ______102

103. amuse 1 afford 2 gift
3 game 4 please ______103

104. lack 1 use 2 want
3 admit 4 apart ______104

105. cease 1 consent 2 concert
3 stop 4 strain ______105

106. disguise 1 reveal 2 declare
3 show 4 mask ______106

107. distinct 1 success 2 clear
3 interest 4 noticed ______107

108. sincere 1 satisfactory 2 genuine
3 hopeful 4 noble ______108

109. lofty 1 tone 2 high
3 example 4 toil ______109

110. extend 1 refuse 2 remain
3 lengthen 4 revert ______110

111. condemn 1 false 2 blame
3 oppose 4 alarm ______111

112. humble 1 secure 2 dwelling
3 lowly 4 proud ______112

113. expert 1 average 2 master
3 business 4 student ______113

114. apply 1 piece 2 use
3 correct 4 mean ______114

115. legal 1 lawful 2 court
3 lawyer 4 humane ______11

116. endeavor 1 help 2 hero
3 attempt 4 harm ______11

117. conclusion 1 settlement 2 end
3 journey 4 right ______11

118. obscure 1 clear 2 hidden
3 odd 4 quaint ______11

119. extraordinary 1 loud 2 unusual
3 particular 4 favorable ______11

120. location 1 relieve 2 choice
3 view 4 situation ______12

121. imaginary 1 existing 2 trifling
3 unreal 4 substantial ______12

122. escort 1 avoid 2 occasion
3 attend 4 remain ______12

123. merit 1 deserve 2 merry
3 desire 4 just ______12

124. compile 1 aid 2 ample
3 collect 4 answer ______12

125. console 1 empower 2 reduce
3 order 4 comfort ______12

126. legislator 1 elector 2 lawmaker
3 minor 4 citizen ______12

127. revert 1 persist 2 perplex
3 return 4 unknown ______12

128. significance 1 prevention 2 age
3 meaning 4 certainty ______12

129. petulant 1 oppressive 2 stagnant
3 sprightly 4 peevish ______12

130. dispute 1 disturb 2 question
3 subdue 4 disguise ______13

131. deplete 1 complete 2 final
3 exhaust 4 fearless ______13

132. compassionate 1 sly 2 free
3 respectful 4 kind ______13

133. deter 1 meddle 2 applaud
3 hinder 4 recline ______13

134. complex 1 simple 2 compliment
3 complexion 4 mixed ______13

135. dispatch 1 discount 2 mood
3 relieve 4 haste ______13

136. venerable 1 adequate 2 aged
3 youthful 4 reliable ______13

137. conceited 1 variable 2 connected
3 vain 4 conquest ______13

138. malign 1 insure 2 slander
3 muffle 4 invade ______13

139. facile 1 fragile 2 futile
3 easy 4 remote ______13

140. empower 1 enlarge 2 permit
3 surpass 4 indulge ______14

STOP

Test 7 Score
(number right)..............................

®California Short-Form Test of Mental Maturity
Elementary · GRADES 4-5-6-7-8 · '57 S-Form

DEVISED BY E. T. SULLIVAN, W. W. CLARK, AND E. W. TIEGS

Name .... Grade .... Boy Gi
Last First Middle (Circle on

School .... City .... Date of Test ....
Month Day Year

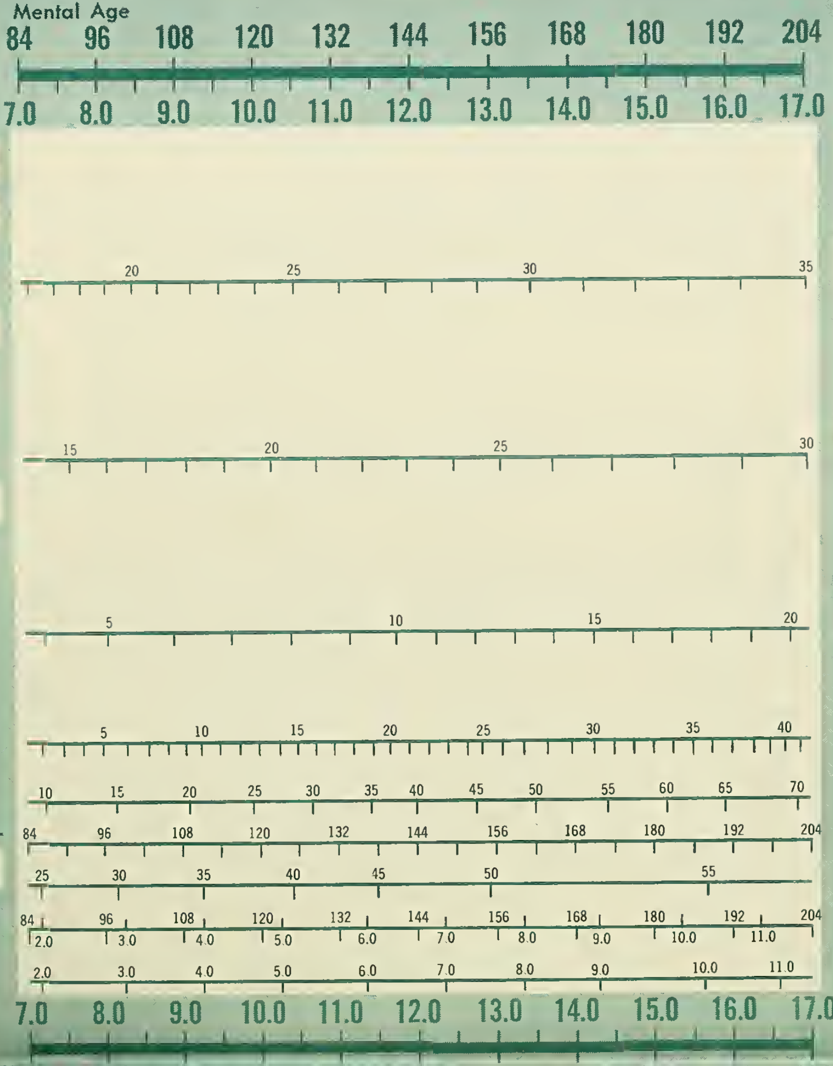
Teacher or Examiner .... ( ) Pupil's Age .... Date of Birth ....
Month Day Year

See MANUAL for instructions.

Factor	Test	Possible Score	Pupil's Score L	Pupil's Score NL	%-ile Rank for C.A.
SPATIAL RELATIONSHIPS	1. Sensing Right and Left	20			
	2. Manipulation of Areas	15			
	TOTAL (1 + 2)	35			
LOGICAL REASONING	3. Similarities	15			
	4. Inference	15			
	TOTAL (3 + 4)	30			
NUMERICAL REASONING	5. Number Series	10			
	6. Numerical Quantity	15			
	TOTAL (5 + 6)	25			
VERBAL CONCEPTS	7. VERBAL CONCEPTS	50			
	TOTAL (7)	50			
	LANGUAGE DATA	80			
	MENTAL AGE				
	NON-LANGUAGE DATA	60			
	CHRONOLOGICAL AGE				
	Average Grade Placement Equivalent INTELL. (M. A.) GRADE PLACEMENT				

DIAGNOSTIC PROFILE

(Chart Pupil's Scores Here)



SUMMARY OF DATA

	LAN-GUAGE DATA	NON-LANG. DATA	TOTAL DATA L + NL / 2
SCORE			
M.A. divided by			
C.A. equals			
I.Q.*			
INTELL. (M. A.) G. P.			

*Shift decimal two places to the right before recording.

For comparison and prediction, use I.Q. pe centile norms in table entitled "I.Q.'s f Various Populations" in Part 4 of the Manu

	LANG. I. Q.	NON-LANG. I. Q.	TOTAL I. Q.
Normal Population			
9th Grade			
10th Grade			
11th Grade			
12th Grade			
College Freshmen			
College Sophomores			

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E

W

INSTRUCTIONS TO PUPILS:

This is a test of your achievement in reading, arithmetic, and language. In taking the first part you will show how many words you know and how well you understand what you read. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

1957 EDITION

18th Printing

BLISHED BY CALIFORNIA TEST BUREAU, DEL MONTE RESEARCH PARK, MONTEREY, CALIFORNIA
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DIRECTIONS: Mark as you are told the number of the word that means the opposite or about the opposite of the first word.

SAMPLE: A. happy ^{1}black ^{2}run ^{3}sad ^{4}rich

Correct Test Booklet Mark
3 A

Correct Answer Sheet Mark

	1	2	3	4
A	☐	☐	■	☐

TEST 1 — SECTION A

l. **more** ^{1}several ^{2}free ^{3}less ^{4}inside ____ 1

2. **few** ^{1}many ^{2}seldom ^{3}plucky ^{4}foolish ____ 2

3. **larger** ^{1}angry ^{2}smoother ^{3}bigger ^{4}smaller ____ 3

4. **start** ^{1}invite ^{2}race ^{3}strike ^{4}finish ____ 4

5. **sum** ^{1}chief ^{2}difference ^{3}vessel ^{4}spot ____ 5

6. **empty** ^{1}tie ^{2}fill ^{3}fall ^{4}remove ____ 6

7. **divisor** ^{1}echo ^{2}cap ^{3}multiplier ^{4}desire ____ 7

8. **even** ^{1}odd ^{2}smooth ^{3}open ^{4}nasty ____ 8

9. **reduce** ^{1}recite ^{2}reply ^{3}stop ^{4}increase ____ 9

0. **part** ^{1}hand ^{2}fact ^{3}total ^{4}jewel ____ 10

1. **choose** ^{1}reject ^{2}seize ^{3}vote ^{4}flash ____ 11

2. **quotient** ^{1}accident ^{2}product ^{3}continent ^{4}deduction ____ 12

GO RIGHT ON TO THE NEXT SECTION

Test 1 — Sec. A Score (number right)

TEST 1 — SECTION B

13. **wild** ^{1}mild ^{2}tame ^{3}famous ^{4}same ____ 13

14. **question** ^{1}column ^{2}mark ^{3}habit ^{4}answer ____ 14

15. **silent** ^{1}gigantic ^{2}motionless ^{3}noisy ^{4}simple ____ 15

16. **agree** ^{1}disagree ^{2}discuss ^{3}preside ^{4}gain ____ 16

17. **break** ^{1}rock ^{2}fracture ^{3}fly ^{4}fix ____ 17

18. **together** ^{1}cloistered ^{2}separated ^{3}mixed ^{4}high ____ 18

19. **grouped** ^{1}seasoned ^{2}cancelled ^{3}scattered ^{4}troubled ____ 19

20. **majority** ^{1}minority ^{2}crowd ^{3}valley ^{4}crew ____ 20

21. **vacant** ^{1}old ^{2}full ^{3}lost ^{4}polite ____ 21

22. **shrinking** ^{1}warping ^{2}fading ^{3}broadening ^{4}swelling ____ 22

23. **posterior** ^{1}immaterial ^{2}anterior ^{3}rear ^{4}curved ____ 23

24. **soil** ^{1}clean ^{2}slide ^{3}track ^{4}toil ____ 24

25. **humid** ^{1}humming ^{2}damp ^{3}arid ^{4}still ____ 25

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 1 — Sec. B Score (number right)

DIRECTIONS: Mark as you have been told the number of the word that means the opposite or about the opposite of the first word.

SAMPLE: B. happy ^{1}black ^{2}run
^{3}sad ^{4}rich

Correct Test Booklet Mark
3 B

Correct Answer Sheet Mark
1 2 3 4
B ⁞ ⁞ ❙ ⁞

TEST 1—SECTION C

26. country ^{1}farm ^{2}crops
^{3}land ^{4}city ____26

27. offer ^{1}refuse ^{2}reply
^{3}open ^{4}hope ____27

28. discourage ^{1}divide ^{2}encourage
^{3}conquer ^{4}league ____28

29. knowledge ^{1}vigor ^{2}pain
^{3}ignorance ^{4}park ____29

30. tame ^{1}wild ^{2}spoiled
^{3}playful ^{4}spotted ____30

31. dry ^{1}moist ^{2}evil
^{3}alive ^{4}cold ____31

32. male ^{1}boy ^{2}friend
^{3}couple ^{4}female ____32

33. captive ^{1}tight ^{2}purple
^{3}free ^{4}second ____33

34. east ^{1}north ^{2}easy
^{3}west ^{4}best ____34

35. ascend ^{1}transcend ^{2}pretend
^{3}descend ^{4}defend ____35

36. lend ^{1}mend ^{2}borrow
^{3}mourn ^{4}hurt ____36

37. industry ^{1}railroad ^{2}speech
^{3}culture ^{4}agriculture ____37

GO RIGHT ON TO THE NEXT SECTION

Test 1 — Sec. C Score
(number right)..............................

TEST 1—SECTION D

38. begin ^{1}free ^{2}fly
^{3}cry ^{4}end ____3

39. true ^{1}natural ^{2}false
^{3}blue ^{4}straight ____3

40. loser ^{1}winner ^{2}window
^{3}race ^{4}griever ____4

41. ordinary ^{1}local ^{2}divine
^{3}unusual ^{4}content ____4

42. fancy ^{1}merry ^{2}plain
^{3}frayed ^{4}pear ____4

43. funny ^{1}special ^{2}minute
^{3}solemn ^{4}sole ____4

44. dainty ^{1}coarse ^{2}fine
^{3}colored ^{4}airy ____4

45. active ^{1}lazy ^{2}understood
^{3}related ^{4}awkward ____4

46. rage ^{1}anger ^{2}loss
^{3}number ^{4}joy ____4

47. pleasure ^{1}deed ^{2}harm
^{3}pain ^{4}mist ____4

48. tardy ^{1}ready ^{2}prompt
^{3}blundering ^{4}humorless ____4

49. sensible ^{1}alert ^{2}difficult
^{3}legal ^{4}ignorant ____4

50. sufficient ^{1}pleasant ^{2}degree
^{3}reticent ^{4}inadequate ____5

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 1 — Sec. D Score
(number right)..............................

TEST 2—SECTION E

DIRECTIONS: Read the following directions. Mark as you are told the number or letter of each correct answer.

. By crossing out two letters, you can make **friend** out of the word **friendly.** Mark the number of the two letters which would be crossed out.

1 **ly**
2 **fy**
3 **lf**
4 **dy** ______51

2. One of the words below is in this sentence. Mark its number.

1 **those**
2 **one**
3 **wild**
4 **beside** ______52

3. Mark the number of the letter which must be added to **hom** to make **home.**

1 **i**
2 **a**
3 **s**
4 **e** ______53

4. Read the following names:

Marie Arthur Richard Mae

Mark the number which shows the first letter of the girls' names.

1 **A**
2 **M**
3 **R**
4 **N** ______54

5. Mark the number of the word that is **rat** spelled backward.

1 **tar**
2 **atr**
3 **rta**
4 **tra** ______55

56. To make the word **catch** you need to put two letters between **ca** and **h.** Mark the number of the two letters.

1 **at**
2 **ch**
3 **ca**
4 **tc** ______56

57. A compound word is formed by joining two or more words, such as **earth** and **quake,** forming the word **earthquake.** The words **play** and **ground** will form a word, too. Mark its number.

1 **playground**
2 **playarea**
3 **playingground**
4 **playyard** ______57

58. The first sixteen letters of the alphabet are:

a b c d e f g h i j k l m n o p

One of the words below ends with the sixth letter of the alphabet. Mark its number.

1 **below**
2 **letter**
3 **with**
4 **brief** ______58

59. A prefix consists of one or more letters placed before a root or a simple word to form a new word. Mark the number of the new word which has the prefix **un** added to the word **afraid.**

1 **unafraid**
2 **unaltered**
3 **unknown**
4 **undoing** ______59

GO RIGHT ON TO THE NEXT PAGE

TEST 2—SECTION E (Continued)

60. The suffix **ness** is used to form nouns meaning state or condition, such as **ill, illness.** Mark the number of the word which has the suffix **ness** added to the word **hard.**

1 **hardiness**
2 **ness**
3 **hard**
4 **hardness**

_____60

61. Some of the Roman numerals and their values are:

IX = 9 **XIX = 19**
XX = 20 **XXI = 21**

Mark the letter of the Roman numeral for 19.

a **XIX**
b **IX**
c **XXI**
d **XX**

_____61

62. Read these letters:

w k o g n j f p d

Mark the number of the third letter to the right of **g.**

1 **j**
2 **p**
3 **f**
4 **d**

_____62

63. The suffix **able** can be added to a word such as **peace** to make the new word **peaceable.** Mark the number of the new word which has the suffix **able** added to the word **transfer.**

1 **transfer**
2 **transmittable**
3 **treasonable**
4 **transferable**

_____63

64. Read these numbers:

9 4 7 3 2 8 6 5 1

Mark the letter of the fifth number to the left of **5.**

a **4**
b **2**
c **9**
d **7**

65. Mark the number of the fifth letter of the last word of this sentence.

1 **n**
2 **a**
3 **e**
4 **r**

66. Read these numbers:

6 3 4 8 5 2 1 9 0

Mark the letter of the third number to the right of **8.**

a **1**
b **9**
c **6**
d **3**

67. Mark the number of the eighth word in this sentence.

1 **this**
2 **in**
3 **word**
4 **line**

68. Read the following names:

Carl Joy Grace Henry

Mark the number which shows the first letters of the boys' names.

1 **CJ**
2 **JG**
3 **GH**
4 **HC**

GO RIGHT ON TO THE NEXT PAGE

TEST 2—SECTION E (Continued)

9. Words ending with **e** generally drop the **e** before suffixes beginning with a vowel, such as **admire, admirable.** Mark the number of the word which has the suffix **able** added to the word **pleasure.**

1 **pleasureable**
2 **admirable**
3 **pleasurable**
4 **able** ______69

70. Words ending with **y** usually change the **y** to **i** before the suffix is added, such as **easy** changed to **easily.** Mark the number of the word which has the suffix **ful** added to the word **plenty.**

1 **partly**
2 **plentiful**
3 **plentyful**
4 **plentfull** ______70

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 2 — Sec. E Score
(number right)

TEST 2—SECTION F

DIRECTIONS: Mark as you have been told the number or letter of each correct answer.

71. The title is found in what part of a book?

¹ **beginning**
² **middle**
³ **end** ____71

✓ **Look at the following Table of Contents and find the answers to items 72, 73, and 74.**

TABLE OF CONTENTS

Chapter	Page
1. Corn and Its Cultivation	1
2. The Rubber Tree	21
3. The Mushroom Family	43
4. Wheat of the Grass Family	52
5. The Bean Family	69
6. Strong Man Oak	74

72. Mark the letter of the page which shows where "The Bean Family" begins.

ᵃ **43**
ᵇ **52**
ᶜ **69**
ᵈ **74** ____72

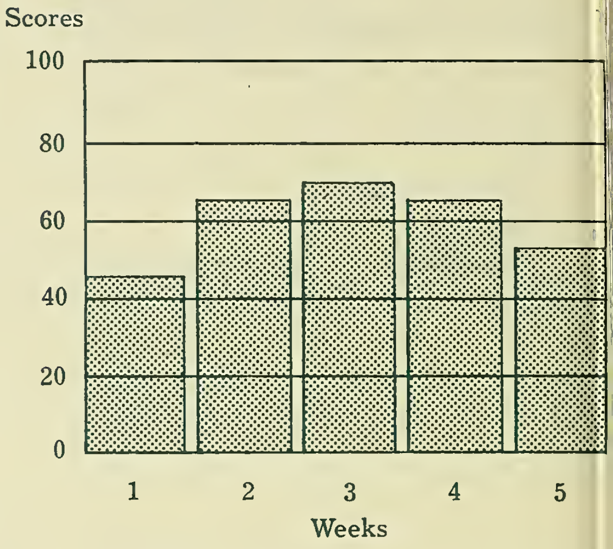
73. Mark the number which shows what story begins on page 74.

¹ **Corn and Its Cultivation**
² **Strong Man Oak**
³ **The Bean Family**
⁴ **The Rubber Tree** ____73

74. Mark the number which shows to which chapter the material on page 33 belongs.

1 2 3 4 ____74

✓ **Below is a bar graph of Joe's arithmetic te scores for 5 weeks. Read the graph and ma the letter or number of the correct answe to questions 75 through 79.**



75. In which two weeks did Joe make the same score on the tests?

ᵃ **2 and 3**
ᵇ **2 and 4**
ᶜ **1 and 4**
ᵈ **4 and 5** ____7

76. In which week did Joe make the highest score?

ᵃ **4**
ᵇ **3**
ᶜ **2**
ᵈ **1** ____7

77. In which week did Joe make the lowest score?

ᵃ **3**
ᵇ **2**
ᶜ **1**
ᵈ **5** ____7

GO RIGHT ON TO THE NEXT PAGE

TEST 2—SECTION F (Continued)

8. The graph you have just read is called a

¹ **bar graph.**
² **circle graph.**
³ **picture graph.**
⁴ **line graph.** ______78

9. What was Joe's score in the first week?

a **35**
b **40**
c **45**
d **65** ______79

Read this list of words:

yard
jar
help
quiet

pail
bell
king
ripe

If the above words were arranged alphabetically,

0. **help** would come next after

¹ **bell.**
² **king.**
³ **yard.**
⁴ **jar.** ______80

1. **pail** would come next after

¹ **quiet.**
² **jar.**
³ **king.**
⁴ **ripe.** ______81

✓ **Look at this partial index and find the answers to items 82, 83, and 84.**

INDEX

Gold: 220, 309, 823; in Alaska, 233; in Australia, 305; in Canada, 296-297; in the Rocky Mountains, 48.

Graf Zeppelin, 223.

Grapefruit, 49, 103, 110, 624.

Grapes: 92, 261, 304, 378; in Canada, 295; in France, 379; in the United States, 49.

Grazing, 35, 36, 46, 48.

Great Britain: 7, 8, 233, 403; as a commercial nation, 277-288; coal, 151; navy, 158; trade with the United States, 62.

82. Mark the letter which shows on what page information concerning the Graf Zeppelin will be found.

a **233**
b **223**
c **103**
d **48** ______82

83. Mark the letter which shows on what page information concerning grapes in France will be found.

a **49**
b **261**
c **295**
d **379** ______83

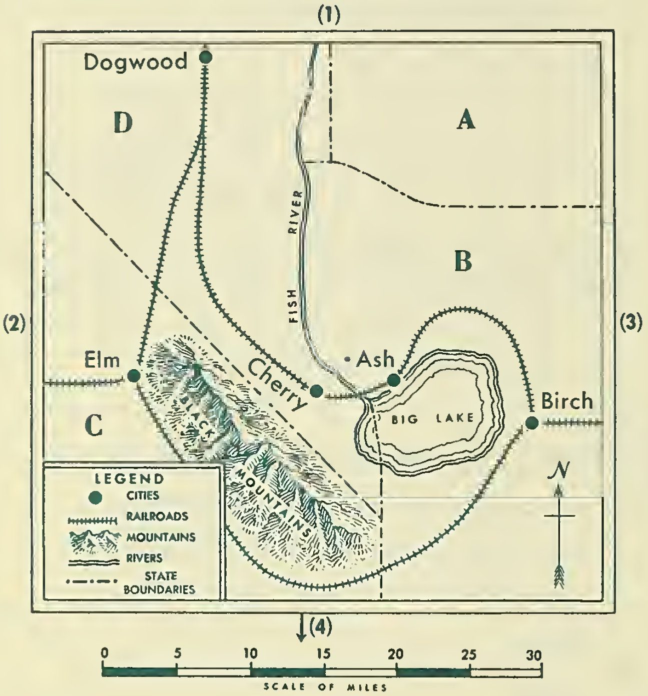
84. Mark the letter which shows on what page information about Great Britain's trade with the United States will be found.

a **403**
b **277**
c **151**
d **62** ______84

GO RIGHT ON TO THE NEXT PAGE

TEST 2—SECTION F (Continued)

✓ The map below is of a make-believe country. It is made up of four states: A, B, C, and D. Study the map and mark the number or letter of the correct answers to questions 85 through 90.



85. In what state are there mountains?

¹ **A**
² **B**
³ **C**
⁴ **D** ____85

86. How far is it from Dogwood to Cherry?

ᵃ **10 miles**
ᵇ **25 miles**
ᶜ **50 miles**
ᵈ **5 miles** ____86

87. What city is on a lake?

¹ **Ash**
² **Elm**
³ **Cherry**
⁴ **Dogwood** ____8

88. There is a number on each side of the map. In which direction does the arrow by number 4 point?

¹ **north**
² **east**
³ **west**
⁴ **south** ____8

89. What city is northwest of Ash?

¹ **Birch**
² **Cherry**
³ **Elm**
⁴ **Dogwood** ____8

90. Between what two states does a river form part of the boundary?

¹ **B and D**
² **A and B**
³ **B and C**
⁴ **A and C** ____9

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 2 — Sec. F Score
(number right)...

TEST 2—SECTION G

Read this story:

The polar bear is the king of the frozen rth. The white coat of the polar bear is so nilar to his surroundings that it is a great lp to him in his hunting and in protecting n from danger.

The polar bear's feet are heavily covered th hair. His vision is very good and he has sharp sense of smell. He is the best swimmer the bear family. Fish, seals, sea lions, and lruses furnish most of his food.

During the winter the female bear buries rself in the snow and there the young are rn. The cubs weigh not more than two unds and are only ten inches long. When lly grown they weigh about 1600 pounds d stand nine feet tall. These bears live about rty years.

The polar bear is hunted by Eskimos, who t the flesh, use the bones for tools, and make e skin into rugs and garments.

Mark as you have been told the number or letter of each correct answer. You may look back to find the answers.

1. The best title for the above story is

^{1} **"Wild Animals."**
^{2} **"The Polar Bear."**
^{3} **"The Frozen North."**
^{4} **"Friend of the Eskimo."** ——91

2. A polar bear's feet, with their heavy covering of hair, are especially useful when he moves around

^{1} **on the sandy beaches.**
^{2} **on the rocky ground.**
^{3} **on the ice and snow.**
^{4} **on the sharp stones.** ——92

93. For food, polar bears hunt for

^{1} **fish and seals.**
^{2} **plants.**
^{3} **honey.**
^{4} **birds.** ——93

94. At birth, the polar bear cubs weigh

^{a} **about two pounds.**
^{b} **about 1600 pounds.**
^{c} **about two ounces.**
^{d} **about ten pounds.** ——94

95. Polar bears live about

^{1} **four years.**
^{2} **forty years.**
^{3} **nine years.**
^{4} **twenty years.** ——95

96. The polar bear's sense of smell is important because

^{1} **of the wild flowers.**
^{2} **he can't see well.**
^{3} **he is so big.**
^{4} **he uses it in hunting.** ——96

97. Of the bear family, the polar bear is the

^{1} **strongest.**
^{2} **gentlest.**
^{3} **smallest.**
^{4} **best swimmer.** ——97

98. A polar bear's home is in the

^{1} **cold regions.**
^{2} **forests.**
^{3} **deserts.**
^{4} **villages.** ——98

GO RIGHT ON TO THE NEXT PAGE

✓ **Read this story:**

The largest country in North America is Canada. It makes up the northern half of the continent.

Canada has an irregular coastline with many fine harbors. It is lacking in large ports because most of the harbors are icebound in the winter. This is a serious handicap to the development of trade.

The western shores of Canada are washed by the Pacific Ocean, the eastern shores by the Atlantic Ocean, and the northern shores by the Arctic Ocean.

Canada is rich in mineral wealth and natural resources, but the population is still small. During the warm summer season, important agricultural products are grown, the chief of which is wheat.

There are vast areas of valuable forest on the mountains to the west. The many fur-bearing animals that inhabit these areas are a source of large revenue. Most of the rivers and streams of Canada have waterfalls and rapids which give unlimited possibilities for the development of power. Many discoveries have been made of rich deposits of oil, iron ore, and uranium.

✓ **Mark the number of each correct answer. You may look back to find the answers.**

99. The above story is about

¹ **North America.**
² **Canada.**
³ **large countries.**
⁴ **continents.** ———— 99

100. Canada is in the

¹ **eastern part of North America.**
² **southern part of North America.**
³ **western part of North America.**
⁴ **northern part of North America.** ————100

101. The coastline of Canada is

¹ **very smooth.**
² **rugged.**
³ **irregular.**
⁴ **regular.** ————1

102. Canada is bounded on the east by the

¹ **Pacific Ocean.**
² **Atlantic Ocean.**
³ **United States.**
⁴ **Arctic Ocean.** ————1

103. Canada has

¹ **few natural resources.**
² **many large ports.**
³ **fine harbors.**
⁴ **very little water.** ————1

104. A serious handicap for Canadian growth is

¹ **overproduction.**
² **icebound harbors.**
³ **a lack of streams.**
⁴ **no shore line.** ————1

105. Choose the best statement:

¹ **Canada has few natural resources.**
² **Growing cotton is profitable in Canada.**
³ **Canada has many unsettled areas.**
⁴ **Canada is a landlocked area.** ————1

106. One of the major industries of Canada is

¹ **glass blowing.**
² **citrus growing.**
³ **textiles.**
⁴ **mining.** ————1

GO RIGHT ON TO THE NEXT PAGE

TEST 2—SECTION G (Continued)

Read this story:

Asphalt is a semisolid, sticky material
rmed by partial evaporation of certain crude
ls in the earth. Brown to black in color, it
n also be obtained as a by-product in the
eatment of certain petroleums and of coal
r. It is insoluble in water but will dissolve
gasoline.

Asphalt is found principally on the island
Trinidad and in northeastern Venezuela.

The famous asphalt lake of Trinidad is
lled with a thick liquid pitch which comes
om underground sources. This substance
ardens quickly on the surface when exposed
air. No matter how many great slabs of
sphalt are removed, it is renewed from below
just a few hours. The surface of the lake
hard enough to support a narrow-gauge rail-
oad for transporting the large cakes of asphalt
om the lake.

A larger but shallower deposit of asphalt is
und at Bermudez Lake in Venezuela. This
sphalt is softer than that found in Trinidad
nd contains less mineral material. Practically
l native asphalt is too hard for direct use and
ust be heated until the water and gases are
riven off and then mixed with crude oil.

Some of the asphalt from these lakes is
hipped to our country for use in road making,
oofing, waterproofing, and in other ways.
sphalt has been used for paving since the
ays of the Babylonians, who paved their
hariot roads with it.

✓ Mark the number or letter of each correct answer. You may look back to find the answers.

107. The best title for this story is

1 **“Babylonians.”**
2 **“Trinidad and Venezuela.”**
3 **“Uses of Asphalt.”**
4 **“Production of Asphalt.”** ______107

108. Asphalt is obtained in nature from

1 **asphalt mines.**
2 **asphalt lakes.**
3 **asphalt trees.**
4 **minerals.** ______108

109. In addition to road making, asphalt is used for

1 **making paper.**
2 **making rubber.**
3 **producing petroleum.**
4 **roofing.** ______109

110. Asphalt is

a **a semisolid.**
b **a liquid.**
c **a solid.**
d **an oil.** ______110

111. Asphalt has been used

1 **only in modern times.**
2 **primarily for making medicines.**
3 **only for roads.**
4 **for thousands of years.** ______111

GO RIGHT ON TO THE NEXT PAGE

TEST 2—SECTION G (Continued)

✓ Read the eight titles below. You are to select the one that would make the best title for each of the five paragraphs of the story. You may look back to find the answers.

TITLES

1. Trinidad Island Sources
2. Location of Asphalt
3. Underground Sources
4. The Make-up of Asphalt
5. Asphalt in Venezuela
6. Removal of Asphalt
7. Uses of Asphalt
8. Road Making

112. The best title for the first paragraph is number

2. **3.** **4.** **5.** ____112

113. The best title for the second paragraph is number

1. **2.** **3.** **4.** ____113

114. The best title for the third paragraph is number

1. **2.** **3.** **4.** ____114

115. The best title for the fourth paragraph is number

3. **4.** **5.** **6.** ____115

116. The best title for the fifth paragraph is number

5. **6.** **7.** **8.** ____116

The following things are mentioned in th story:

Removing the slabs
Transporting the large cakes
Use in road making
Hardening of the pitch

The order in which the above things ar mentioned in the story is as follows:

117. Removing the slabs was

1st. **2nd.** **3rd.** **4th.** ____11

118. Transporting the large cakes was

1st. **2nd.** **3rd.** **4th.** ____11

119. Use in road making was

1st. **2nd.** **3rd.** **4th.** ____11

120. Hardening of the pitch was

1st. **2nd.** **3rd.** **4th.** ____12

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 2 — Sec. G Score
(number right)..........................

Arithmetic

INSTRUCTIONS TO PUPILS:

This is an arithmetic test. In taking it you will show how well you can think and work problems. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

TEST 3—SECTION A

o not write, mark, or figure on this test booklet unless told to do so by the examiner.

DIRECTIONS: Decide how each of the amounts below should be written as a number. Then mark as you are told the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, mark the letter, e. In taking this test you should finish the first column before going on to the second. Look at the samples to the right and see how they are marked.

Sample A: Twelve
- a 10
- b 12
- c 11
- d 2
- e None

Correct Answer Sheet Mark

	a	b	c	d	e
A	┆	▮	┆	┆	┆

Correct Test Booklet Mark

b A

Sample B: Twenty
- a 22
- b 200
- c 2
- d 21
- e None

Correct Answer Sheet Mark

	a	b	c	d	e
B	┆	┆	┆	┆	▮

Correct Test Booklet Mark

e B

Twenty-six
- a 62
- b .026
- c 26
- d 260
- e None ____ (1)

One hundred eleven
- a 100,11
- b 1101
- c 1011
- d 111,00
- e None ____ (2)

Six hundred thirty-seven
- a 637
- b 600,37
- c 6037
- d 637,00
- e None ____ (3)

Two hundred six
- a 200,6
- b 2600
- c 206
- d 206,0
- e None ____ (4)

Three thousand five
- a 3000,5
- b 3,5000
- c 305
- d 3005
- e None ____ (5)

Three dollars and three cents
- a $3.3¢
- b $3.03
- c $3.3
- d 3.03
- e None ____ (6)

Sixty dollars and eight cents
- a 60.08
- b $60.8
- c $60.8¢
- d $60.08
- e None ____ (7)

✓ **Read these Roman numerals. Then mark as you have been told the letter of each correct answer.**

8. VII means
- a 3
- b 7
- c 6
- d 5
- e None ____ (8)

9. XV means
- a 20
- b 19
- c 15
- d 25
- e None ____ (9)

10. C means
- a 100
- b 200
- c 300
- d 500
- e None ____ (10)

✓ **Find the smallest number, marked a, b, c, or d, in each of the following rows. Then mark its letter.**

11. a 321 b 226 c 128 d 190 ____11

12. a $\frac{1}{3}$ b $\frac{2}{5}$ c $\frac{1}{2}$ d $\frac{4}{5}$ ____12

13. a 121 b 12.67 c 2.0426 d 14.20 ____13

14. a 65 b $\frac{2}{3}$ c $71\frac{1}{2}$ d $\frac{5}{6}$ ____14

15. a $\frac{1}{3}$ b $\frac{5}{6}$ c 25% d $\frac{1}{2}$ ____15

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 3 — Sec. A Score
(number right)

TEST 3—SECTION B

DIRECTIONS: Mark the letter or number of each correct answer. If you do not know an answer, or if you think that none of the answers given is correct, you should mark the letter, e (items 16-19), or the number, 5 (items 20-30). Finish the first column before going on to the second. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

16. $5 \times 6 =$

a 11
b 30
c $\frac{5}{6}$
d $\frac{6}{5}$
e None (16)

17. $15 + 5 =$

a 0
b 1
c 18
d 36
e None (17)

18. $20 - 4 =$

a 5
b $\frac{1}{5}$
c 80
d 16
e None (18)

19. $8 \div 2 =$

a 4
b 16
c $\frac{1}{4}$
d 6
e None (19)

20. — means

1 add
2 subtract
3 multiply
4 divide
5 None (20)

21. + means

1 add
2 subtract
3 multiply
4 divide
5 None (21)

22. × means

1 add
2 subtract
3 multiply
4 divide
5 None (22)

23. ÷ means

1 add
2 subtract
3 multiply
4 divide
5 None (23)

24. sec. means

1 foot
2 second
3 part
4 ratio
5 None (24

25. ¢ means

1 dollar
2 quarter
3 dime
4 nickel
5 None (25

26. % means

1 per cent
2 root
3 inch
4 ratio
5 None (26

27. oz. means

1 hour
2 inch
3 ounce
4 root
5 None (27

28. ° means

1 foot
2 pi
3 degree
4 part
5 None (28

29. ′ means

1 angle
2 at
3 degree
4 foot
5 None (29

30. $\sqrt{\quad}$ means

1 care of
2 less than
3 square root
4 right angle
5 None (30

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 3 — Sec. B Score
(number right) ....

TEST 3—SECTION C

DIRECTIONS: Work these problems. Then mark the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

---

1. Mary has 2 dolls. Her sister has 4 dolls. How many dolls do they have together?

a 2
b 6
c 8
d 3
e None

(31)

---

2. A farmer had 14 cows. He sold 4 of them. How many cows did he have left?

a 18
b 4
c 9
d 56
e None

(32)

---

3. Ted solved 4 problems. Sam solved 3 times as many. How many problems did Sam solve?

a 12
b 7
c 3
d 5
e None

(33)

---

4. Martha is going to set out 30 plants in 5 equal rows. How many plants will there be in each row?

a 30
b 12
c 150
d 6
e None

(34)

---

5. Frank bought 10 marbles and his sister gave him 6 more. He gave away 4 of the marbles. How many did he have left?

a 10
b 12
c 20
d 0
e None

(35)

---

6. A room had 10 rows of chairs with 5 chairs in each row. Four chairs were taken out of the room. How many remained?

a 46
b 15
c 50
d 14
e None

(36)

---

7. Tom had 70 marbles and lost 10. He divided those remaining evenly among his 3 brothers. How many marbles did each receive?

a 60
b 20
c 40
d 10
e None

(37)

GO RIGHT ON TO THE NEXT PAGE

38. Bob paid \$2.25 for a new tire, 75 cents for a seat, and 50 cents for paint. He had \$4.00 to repair his bicycle. How much did he have left?

a \$3.50
b 25¢
c 50¢
d \$1.00
e None

(38)

39. On a map, $\frac{1}{2}$ inch is used to represent 10 miles. The distance between 2 cities on the map is 3 inches. How many miles are they apart?

a 15
b 20
c 30
d 60
e None

(39)

40. Ethel weighs 82 pounds, Marie weighs 68 pounds, and Edna weighs 60 pounds. What is their average weight in pounds?

a 69
b $72\frac{1}{2}$
c 68
d 70
e None

(40)

41. How many square inches are there in a piece of glass 15 inches wide and 20 inches long?

a 35
b 200
c 300
d 150
e None

(41)

42. At a candy sale, two thirds of the class brought fudge to school. There were 33 pupils in the class. How many pupils brought fudge?

a 22
b 21
c 11
d 16
e None

(42)

43. How many one-inch ice cubes can a tray 3 inches wide, 2 inches deep, and 12 inches long hold?

a 24
b 17
c 36
d 72
e None

(43)

44. Our team has played 12 games and lost 3 of them. What per cent of the games did we lose?

a 25
b $33\frac{1}{3}$
c 50
d $\frac{1}{4}$
e None

(44)

45. A man received 6 per cent interest on a loan of \$400 for 1 year. How much interest did he receive?

a \$40.00
b \$2.40
c \$24.00
d \$48.00
e None

(45)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 3 — Sec. C Score (number right) ....

TEST 4—SECTION D

DIRECTIONS: Do these problems in addition. Then mark the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Finish each column before going on to the next. Be sure to reduce fractions to lowest terms. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

46)

$$\begin{array}{r} 5\ 2 \\ +3\ 4 \\ \hline \end{array}$$

a 88

b 86

c 18

d 76

e None ______ (46)

47)

$$\begin{array}{r} 5\ 0 \\ +4\ 6 \\ \hline \end{array}$$

a 116

b 16

c 96

d 960

e None ______ (47)

48)

$$\begin{array}{r} 5\ 0\ 8 \\ +4\ 3\ 0 \\ \hline \end{array}$$

a 938

b 1038

c 78

d 878

e None ______ (48)

49)

$$\begin{array}{r} 4\ 7 \\ +\quad 4 \\ \hline \end{array}$$

a $10\frac{1}{4}$

b 188

c 43

d 51

e None ______ (49)

50)

$$\begin{array}{r} 3\ 8 \\ +2\ 9 \\ \hline \end{array}$$

a 517

b 67

c 9

d 57

e None ______ (50)

51)

$$\begin{array}{r} 2\ 4\ 5 \\ +1\ 7\ 9 \\ \hline \end{array}$$

a 555

b 56464

c 654

d 564

e None ______ (51)

52)

$$\begin{array}{r} 2\ 3\ 1\ 7 \\ 6\ 8\ 9\ 4 \\ 5\ 1\ 3\ 4 \\ +6\ 0\ 2\ 0 \\ \hline \end{array}$$

a 19255

b 20355

c 19365

d 20365

e None ______ (52)

(53)

$$\begin{array}{r} \$\ 4\ 3.5\ 7 \\ 6.8\ 9 \\ .6\ 2 \\ +\quad 7.1\ 5 \\ \hline \end{array}$$

a \$52.33

b \$53.32

c \$58.23

d \$52.32

e None ______ (53)

(54)

$\$10.00 + \$.50 + \$2 + \$1.50 =$

a \$12.02

b \$14.00

c \$21.20

d \$2.12

e None ______ (54)

(55)

$$\begin{array}{r} \frac{1}{2} \\ +\frac{1}{2} \\ \hline \end{array}$$

a 0

b $\frac{1}{4}$

c 24

d 1

e None ______ (55)

(56)

$$\begin{array}{r} \frac{1}{2} \\ +\frac{1}{4} \\ \hline \end{array}$$

a $\frac{1}{6}$

b $\frac{1}{8}$

c $\frac{3}{4}$

d $\frac{1}{3}$

e None ______ (56)

(57)

$$\begin{array}{r} 1\ 2 \\ +\quad 2\frac{3}{4} \\ \hline \end{array}$$

a $14\frac{3}{4}$

b $122\frac{3}{4}$

c $9\frac{1}{4}$

d $5\frac{3}{4}$

e None ______ (57)

(58)

$$\begin{array}{r} \frac{2}{3} \\ +3\frac{1}{6} \\ \hline \end{array}$$

a $3\frac{5}{8}$

b $3\frac{5}{6}$

c $3\frac{7}{8}$

d $3\frac{3}{4}$

e None ______ (58)

(59)

$$\begin{array}{r} 1\ 2\ \frac{1}{4} \\ +\quad 3\ \frac{1}{3} \\ \hline \end{array}$$

a $15\frac{7}{12}$

b $6\frac{7}{12}$

c $15\frac{2}{7}$

d $15\frac{1}{6}$

e None ______ (59)

(60)

$$\begin{array}{r} 5\ \frac{3}{4} \\ +3\ \frac{2}{3} \\ \hline \end{array}$$

a $9\frac{1}{2}$

b $8\frac{5}{12}$

c $8\frac{5}{7}$

d $9\frac{5}{12}$

e None ______ (60)

(61)

$$\begin{array}{r} 3\ 2\ \frac{3}{4} \\ 2\ 1\ \frac{2}{3} \\ +1\ 5\ \frac{1}{2} \\ \hline \end{array}$$

a $69\frac{2}{3}$

b $70\frac{1}{3}$

c $69\frac{11}{12}$

d $71\frac{11}{12}$

e None ______ (61)

(62)

$2\frac{1}{2} + 8.25 =$

a $10\frac{1}{2}.25$

b 11

c $8.27\frac{1}{2}$

d 10.75

e None ______ (62)

(63)

$.05 + .364 + .3409 =$

a .3369

b .7549

c .9749

d .7449

e None ______ (63)

(64)

$32.4 + 2.53 + .0627 + 4 =$

a 1207

b 1604

c 38.9927

d 39.0927

e None ______ (64)

(65)

$$\begin{array}{r} 1 \text{ yd.}\quad 2 \text{ ft.} \\ +2 \text{ yd.}\quad 2 \text{ ft.} \\ \hline \end{array}$$

a 4 yd. 1 ft.

b 3 yd. 1 ft.

c 4 yd.

d 3 yd. 2 ft.

e None

______ (65)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 — Sec. D Score
(number right)

TEST 4—SECTION E

DIRECTIONS: Do these problems in subtraction. Then mark the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Finish each column before going on to the next. Be sure to reduce fractions to lowest terms.

(66)

$$\begin{array}{r} 3\ 8 \\ -2\ 5 \\ \hline \end{array}$$

a 63
b 3
c 13
d 950
e None

(66)

(67)

$$\begin{array}{r} 4\ 5 \\ -\quad 3 \\ \hline \end{array}$$

a 32
b 2
c 48
d 42
e None

(67)

(68)

$$\begin{array}{r} 3\ 9\ 8 \\ -2\ 0\ 3 \\ \hline \end{array}$$

a 195
b 601
c 95
d 185
e None

(68)

(69)

$$\begin{array}{r} 5\ 9\ 0 \\ -1\ 3\ 0 \\ \hline \end{array}$$

a 4600
b 460
c 620
d 660
e None

(69)

(70)

$$\begin{array}{r} 7\ 3 \\ -2\ 9 \\ \hline \end{array}$$

a 102
b 44
c 54
d 96
e None

(70)

(71)

$$\begin{array}{r} 3\ 3\ 5 \\ -2\ 7\ 6 \\ \hline \end{array}$$

a 198
b 530
c 188
d 278
e None

(71)

(72)

$$\begin{array}{r} 6\ 8\ 0\ 5 \\ -2\ 4\ 3\ 8 \\ \hline \end{array}$$

a 4467
b 4267
c 4367
d 4377
e None

(72)

(73)

$$\begin{array}{r} \$\ 1\ 5.0\ 0 \\ -\quad 1.7\ 5 \\ \hline \end{array}$$

a $14.35
b $13.35
c $14.25
d $13.25
e None

(73)

(74)

$74 — $13.75 =

a $87.75
b $60.25
c $87.25
d $60.75
e None

(74)

(75)

$$\begin{array}{r} \frac{1}{6} \\ -\frac{1}{6} \\ \hline \end{array}$$

a 0
b $\frac{1}{2}$
c $\frac{1}{3}$
d 2
e None

(75)

(76)

$$\begin{array}{r} \frac{3}{5} \\ -\frac{1}{5} \\ \hline \end{array}$$

a $\frac{4}{5}$
b $\frac{1}{5}$
c $\frac{2}{5}$
d 2
e None

(76)

(77)

$$\begin{array}{r} \frac{5}{6} \\ -\frac{1}{3} \\ \hline \end{array}$$

a $\frac{4}{3}$
b $\frac{2}{9}$
c $1\frac{1}{3}$
d $\frac{1}{2}$
e None

(77)

(78)

$$\begin{array}{r} \frac{2}{3} \\ -\frac{1}{4} \\ \hline \end{array}$$

a $\frac{1}{3}$
b $\frac{1}{4}$
c $\frac{5}{12}$
d $\frac{1}{12}$
e None

(78)

(79)

$$\begin{array}{r} 7\frac{4}{5} \\ -6\phantom{\frac{4}{5}} \\ \hline \end{array}$$

a $1\frac{1}{5}$
b $\frac{4}{5}$
c $13\frac{4}{5}$
d $1\frac{4}{5}$
e None

(79)

(80)

$$\begin{array}{r} 8\phantom{\frac{1}{3}} \\ -4\frac{1}{3} \\ \hline \end{array}$$

a $3\frac{2}{3}$
b $12\frac{1}{3}$
c $4\frac{1}{3}$
d $\frac{3}{8}$
e None

(80)

(81)

$$\begin{array}{r} 4\ 6\frac{2}{5} \\ -1\ 4\frac{4}{5} \\ \hline \end{array}$$

a $32\frac{2}{5}$
b $31\frac{3}{5}$
c $32\frac{3}{5}$
d $32\frac{4}{5}$
e None

(81)

(82)

$40.7 - 6\frac{1}{2} =$

a 34.2
b $40.1\frac{1}{2}$
c $40\frac{1}{2}$
d $34.7\frac{1}{2}$
e None

(82)

(83)

86.350 — 24.15 =

a 83.935
b 62.100
c 62.2
d 62.22
e None

(83)

(84)

56.08 — 6.0265 =

a 50.535
b 50.5035
c 50.0535
d 50.0553
e None

(84)

(85)

$$\begin{array}{r} 4\text{ ft. }\ 5\text{ in.} \\ -2\text{ ft. }10\text{ in.} \\ \hline \end{array}$$

a 2 ft. 5 in.
b 1 ft. 7 in.
c 1 ft. 5 in.
d 2 ft. 7 in.
e None

(85)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 — Sec. E Score
(number right) ....

TEST 4—SECTION F

DIRECTIONS: Do these problems in multiplication. Then mark the letter of each correct answer. Finish each column before going on to the next. Be sure to reduce fractions to lowest terms.

(86)

$$\begin{array}{r} 2\ 3\ 4 \\ \times\qquad 2 \\ \hline \end{array}$$

a 478

b 236

c 468

d 462

e None

(86)

87)

$$\begin{array}{r} 2\ 0\ 0 \\ \times\qquad 4 \\ \hline \end{array}$$

a 204

b 600

c 196

d 800

e None

(87)

88)

$$\begin{array}{r} 5\ 1 \\ \times\quad 7 \\ \hline \end{array}$$

a 357

b 44

c 58

d 42

e None

(88)

89)

$$\begin{array}{r} 1\ 5 \\ \times\quad 5 \\ \hline \end{array}$$

a 525

b 20

c 75

d 65

e None

(89)

(90)

$$\begin{array}{r} 8\ 0\ 5 \\ \times\qquad 9 \\ \hline \end{array}$$

a 72045

b 7245

c 814

d 796

e None

(90)

(91)

$$\begin{array}{r} 4\ 7\ 9 \\ \times\quad 3\ 2 \\ \hline \end{array}$$

a 15328

b 5382

c 511

d 17418

e None

(91)

(92)

$$\begin{array}{r} 4\ 8\ 9 \\ \times\quad 4\ 0 \\ \hline \end{array}$$

a 529

b 19560

c 1956

d 18460

e None

(92)

(93)

$$\begin{array}{r} 4\ 0\ 0 \\ \times 2\ 0\ 0 \\ \hline \end{array}$$

a 8000

b 6000

c 80000

d 800

e None

(93)

(94)

$$\begin{array}{r} 2\ 0\ 3\ 6 \\ \times\quad 3\ 0\ 8 \\ \hline \end{array}$$

a 627088

b 2344

c 1728

d 11090

e None

(94)

(95)

$$4 \times \frac{1}{2} =$$

a $\frac{1}{2}$

b $\frac{1}{8}$

c $4\frac{1}{2}$

d 2

e None

(95)

(96)

$$\frac{1}{3} \times \frac{1}{3} =$$

a $\frac{1}{6}$

b $\frac{1}{9}$

c $\frac{2}{3}$

d 3

e None

(96)

(97)

$$\frac{1}{4} \times \frac{4}{5} =$$

a $\frac{4}{9}$

b $\frac{1}{4}$

c $\frac{1}{5}$

d $\frac{3}{10}$

e None

(97)

(98)

$$\frac{2}{5} \times \frac{5}{8} =$$

a $\frac{7}{40}$

b $\frac{7}{13}$

c $\frac{1}{5}$

d $\frac{1}{4}$

e None

(98)

(99)

$$6 \times 2\frac{1}{3} =$$

a $4\frac{1}{3}$

b $12\frac{1}{3}$

c 14

d 15

e None

(99)

(100)

$$6\frac{1}{5} \times \frac{3}{4} =$$

a $\frac{6}{29}$

b $6\frac{3}{20}$

c $26\frac{2}{15}$

d $4\frac{13}{20}$

e None

(100)

(101)

$$4\frac{1}{3} \times 5\frac{5}{6} =$$

a 25.07

b $25\frac{5}{18}$

c 21.25

d $21\frac{5}{6}$

e None

(101)

(102)

$$\begin{array}{r} 5\ 8\frac{3}{4} \\ \times 1\ 6\quad \\ \hline \end{array}$$

a 940

b $928\frac{3}{4}$

c 948

d 418

e None

(102)

(103)

$$\begin{array}{r} 2\ 8\ 5\ .\ 7 \\ \times\qquad\qquad 3 \\ \hline \end{array}$$

a 8571

b 286.0

c 285.73

d 857.1

e None

(103)

(104)

$$\begin{array}{r} 6\ 3\ .\ 2\ 7 \\ \times .\ 0\ 0\ \ 2\ 5 \\ \hline \end{array}$$

a 63.52

b .158175

c 15.8175

d 1581.75

e None

(104)

(105)

$$\begin{array}{r} 4 \text{ ft. } 7 \text{ in.} \\ \times \qquad\quad 3 \quad\ \ \\ \hline \end{array}$$

a 13 ft. 9 in.

b 13 ft. 6 in.

c 12 ft. 7 in.

d 3 ft. 9 in.

e None

(105)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 — Sec. F Score
(number right)

TEST 4—SECTION G

DIRECTIONS: Do these problems in division. Then mark the letter of each correct answer. Finish each column before going on to the next. Be sure to express remainders as fractions and reduce fractions to lowest terms.

(106)

$6\overline{)1\ 2}$

a 6
b 2
c 72
d $\frac{1}{2}$
e None

______ (106)

(107)

$9\overline{)4\ 5}$

a 5
b 4
c 6
d 9
e None

______ (107)

(108)

$6\overline{)6\ 0}$

a 1
b $\frac{1}{10}$
c 6
d 10
e None

______ (108)

(109)

$9\overline{)4\ 5\ 9}$

a 501
b 510
c 51
d 50.9
e None

______ (109)

(110)

$6\overline{)1\ 9\ 8}$

a 303
b 330
c $116\frac{1}{3}$
d 33
e None

______ (110)

(111)

$4\overline{)4\ 3\ 6}$

a 19
b 190
c 109
d 119
e None

______ (111)

(112)

$40\overline{)4\ 4\ 0}$

a 11
b 1100
c $1\frac{1}{10}$
d 110
e None

______ (112)

(113)

$33\overline{)6\ 7\ 3\ 2}$

a 203
b 204
c 2004
d 1994
e None

______ (113)

(114)

$400\overline{)\ 8\ 0\ 0\ 0}$

a 8400
b 200
c 20
d 2
e None

______ (114)

(115)

$54\overline{)4\ 8\ 9\ 2}$

a $9\frac{25}{27}$
b 9 +
c $89\frac{86}{54}$
d $90\frac{16}{27}$
e None

______ (115)

(116)

$2 \div \frac{1}{2} =$

a 4
b $\frac{1}{4}$
c 2
d 1
e None

______ (116)

(117)

$\frac{1}{2} \div 3 =$

a 6
b $\frac{2}{3}$
c $\frac{1}{6}$
d $\frac{5}{6}$
e None

______ (117)

(118)

$7 \div \frac{2}{3} =$

a $4\frac{2}{3}$
b $10\frac{1}{2}$
c $\frac{2}{21}$
d $14\frac{1}{3}$
e None

______ (118)

(119)

$\frac{3}{5} \div \frac{3}{5} =$

a $\frac{9}{25}$
b $\frac{3}{5}$
c $2\frac{7}{25}$
d 1
e None

______ (119)

(120)

$\frac{4}{5} \div \frac{3}{10} =$

a $2\frac{2}{3}$
b $\frac{3}{5}$
c $\frac{7}{40}$
d $\frac{7}{15}$
e None

______ (120)

(121)

$6\frac{2}{3} \div \frac{5}{6} =$

a $\frac{1}{8}$
b $18\frac{1}{3}$
c $7\frac{2}{10}$
d 8
e None

______ (121)

(122)

$4\frac{2}{3} \div 2\frac{1}{4} =$

a $2\frac{2}{27}$
b $2\frac{27}{56}$
c $\frac{6}{63}$
d $10\frac{1}{2}$
e None

______ (122)

(123)

$3\overline{)6\ 2\ \frac{1}{2}}$

a $2\frac{5}{6}$
b $21\frac{5}{6}$
c $20\frac{5}{6}$
d 21
e None

______ (123)

(124)

$6\overline{)7.0\ 2}$

a 117
b 1.17
c .117
d 11.7
e None

______ (124)

(125)

$.04\overline{).5\ 0\ 4}$

a 1260
b 12.6
c 1.26
d .126
e None

______ (125)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 — Sec. G Score
(number right) ....

Language

INSTRUCTIONS TO PUPILS:

This is a language test. In taking it you will show what you know about capitalization, punctuation, and words and sentences, and how well you can spell. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

TEST 5—SECTION A

DIRECTIONS: In each line of the sentences and story below, four words have a number above the first letter. If ONE of the letters should be a capital, mark its number. If none of the four letters should be a capital, mark N, which stands for None. Not more than one letter with a number over it should be a capital on any one line.

		Correct Test Booklet Mark		Correct Answer Sheet Mark
SAMPLE:	A. The $\overset{1}{\text{winner}}$ of the $\overset{2}{\text{race}}$ $\overset{3}{\text{was}}$ $\overset{4}{\text{tom}}$.	*4*	A	A 1 2 3 [✓ 4] N
SAMPLE:	B. He is $\overset{1}{\text{one}}$ of $\overset{2}{\text{my}}$ $\overset{3}{\text{best}}$ $\overset{4}{\text{friends}}$.	*N*	B	B 1 2 3 4 [✓ N]

In Sample A, the "t" in "tom," which has a 4 above it, should be a capital. Notice how the 4 has been marked. In Sample B, none of the letters with numbers above them should be capitals, so the N has been marked.

SENTENCES

1. $\overset{1}{\text{winter}}$ $\overset{2}{\text{has}}$ $\overset{3}{\text{gone}}$ at $\overset{4}{\text{last}}$. ____ 1
2. Is $\overset{1}{\text{it}}$ $\overset{2}{\text{raining}}$ $\overset{3}{\text{in}}$ $\overset{4}{\text{seattle}}$? ____ 2
3. The $\overset{1}{\text{abbreviation}}$ $\overset{2}{\text{for}}$ $\overset{3}{\text{december}}$ $\overset{4}{\text{is}}$ ____ 3
4. $\overset{1}{\text{known}}$ $\overset{2}{\text{to}}$ $\overset{3}{\text{be}}$ $\overset{4}{\text{dec}}$. ____ 4
5. The $\overset{1}{\text{man}}$ $\overset{2}{\text{bought}}$ $\overset{3}{\text{bill}}$ $\overset{4}{\text{and}}$ ____ 5
6. $\overset{1}{\text{me}}$ $\overset{2}{\text{some}}$ $\overset{3}{\text{chocolate}}$ $\overset{4}{\text{candy}}$. ____ 6
7. A $\overset{1}{\text{week}}$ ago Mr. $\overset{2}{\text{brown}}$, $\overset{3}{\text{my}}$ $\overset{4}{\text{partner}}$, ____ 7
8. $\overset{1}{\text{came}}$ $\overset{2}{\text{home}}$ from $\overset{3}{\text{india}}$ after a $\overset{4}{\text{month's}}$ visit. ____ 8
9. Last $\overset{1}{\text{week}}$ $\overset{2}{\text{i}}$ $\overset{3}{\text{saw}}$ $\overset{4}{\text{his}}$ ____ 9
10. $\overset{1}{\text{uncle}}$ Ned $\overset{2}{\text{at}}$ $\overset{3}{\text{the}}$ $\overset{4}{\text{show}}$. ____ 10

STORY

11. $\overset{1}{\text{yesterday}}$ $\overset{2}{\text{my}}$ $\overset{3}{\text{friend}}$ and I rode $\overset{4}{\text{home}}$ on ____ 11
12. $\overset{1}{\text{the}}$ bus from $\overset{2}{\text{summer}}$ $\overset{3}{\text{camp}}$ near $\overset{4}{\text{denver}}$. We saw ____ 12
13. $\overset{1}{\text{a}}$ $\overset{2}{\text{poster}}$ saying the circus $\overset{3}{\text{would}}$ be on $\overset{4}{\text{hill}}$ ____ 13

GO RIGHT ON TO THE NEXT PAGE

TEST 5—SECTION A (Continued)

14. Street on ^{1}the 8th ^{2}of ^{3}july this ^{4}year. ______14

15. I ^{1}remembered ^{2}that ^{3}uncle Tod ^{4}used to be ______15

16. ^{1}a clown in a ^{2}circus when ^{3}he was ^{4}young. ______16

17. He told ^{1}me of the ^{2}time in ^{3}florida when ^{4}another ______17

18. ^{1}clown poured water in his ^{2}hat, and ^{3}i ^{4}laughed ______18

19. ^{1}till it hurt. My ^{2}uncle ^{3}lives near ^{4}zion Park now. ______19

20. He ^{1}would like to ^{2}travel ^{3}across the ^{4}ocean ______20

21. and see ^{1}circuses in ^{2}italy and ^{3}other ^{4}countries. ______21

22. ^{1}my ^{2}friend ^{3}wants to earn ^{4}circus passes ______22

23. like ^{1}bob, ^{2}his ^{3}brother, did by carrying ^{4}water ______23

24. to ^{1}the ^{2}elephants. He ^{3}said, ^{4}“we’re strong ______24

25. ^{1}enough to do ^{2}that now. Don’t ^{3}you ^{4}think so?” ______25

26. My ^{1}birthday ^{2}is on ^{3}memorial Day, ^{4}which ______26

27. ^{1}is ^{2}already ^{3}past, so ^{4}i am now eleven years old. ______27

28. My answer was, “^{1}yes, ^{2}we are; ^{3}but ^{4}they say that ______28

29. the ^{1}man who does ^{2}magic in the ^{3}sideshow, ^{4}mr. ______29

30. ^{1}jasper, is ^{2}good. Maybe ^{3}we can get a ^{4}job with ______30

31. that ^{1}german ^{2}boss ^{3}putting up the ^{4}sideshow ______31

32. tent. Besides, ^{1}elephants ^{2}are ^{3}always ^{4}thirsty!” ______32

SENTENCES

33. Few ^{1}people ^{2}visit ^{3}the ^{4}cold ______33

34. Rocky ^{1}mountains ^{2}during the ^{3}winter ^{4}months. ______34

35. ^{1}wheat, ^{2}oats, ^{3}and ^{4}corn ______35

36. ^{1}grow ^{2}in ^{3}beautiful ^{4}wisconsin. ______36

37. He ^{1}said, “^{2}you ^{3}may go ^{4}now.” ______37

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 5 — Sec. A Score (number right)

TEST 5—SECTION B

DIRECTIONS: In the letter and story below, each line has a number, such as 38, 39, or 40. If a punctuation mark is needed where the number is, make a black mark within the pair of dotted lines under the punctuation mark needed. If no punctuation is needed, make a black mark under the N, which stands for None. Only one answer should be given for each line.

Correct Test Booklet and Answer Sheet Mark

		.	,	?	"	N
SAMPLE: C. Mary$_1$ will you come with us?	1		✓			
SAMPLE: D. The bus$_2$ is leaving at ten o'clock.	2					✓

In Sample C, a comma is needed at 1 after the word "Mary," so a mark has been made und the comma in answer row 1. In Sample D, no punctuation mark is needed at 2, so the N h been marked in answer row 2. If you are using an answer sheet, do not mark on this pag

---

225 Fourth Street

		.	,	?	"	N
Chicago$_{38}$ Illinois	38					
April 7$_{39}$ 1956	39					
Dear Bob$_{40}$	40					
I was very happy to get your letter$_{41}$	41					
How are you and your family these days$_{42}$	42					
I miss you and your brother a lot. Mother$_{43}$	43					
Dad, and I$_{44}$ are all fine, but Ruth has not	44					
been so lucky. She had to see Dr$_{45}$ Roberts	45					
because$_{46}$ she had a bad cold.	46					
He asked, $_{47}$Ruth, will you do something?"	47					
"Yes$_{48}$ I'll try," Ruth said. "What is it?"	48					
"Go home and take these pills$_{49}$" he said.	49					
"Then jump into bed and get lots of sleep.$_{50}$	50					
He told Mother$_{51}$ to read her an interesting	51					
book like $_{52}$*Treasure Island,* written by	52					

GO RIGHT ON TO THE NEXT PAGE

TEST 5—SECTION B (Continued)

		.	,	?	"	N
Robert L$_{53}$ Stevenson. It is a very good book.	53	.	,	?	"	N
Have you read it$_{54}$ I read it last summer.	54	.	,	?	"	N
Well, I guess I'd better say good-bye$_{55}$	55	.	,	?	"	N
I'll see you in about two weeks. Bob$_{56}$ will	56	.	,	?	"	N
you be able to find me a nice picture post card$_{57}$	57	.	,	?	"	N
Mail it from Dallas$_{58}$ Texas if you can.	58	.	,	?	"	N
Sincerely yours$_{59}$	59	.	,	?	"	N
Dave$_{60}$	60	.	,	?	"	N

STORY

		.	,	?	"	N
Tom wanted a bicycle$_{61}$ to	61	.	,	?	"	N
ride to school$_{62}$and his Uncle Ed	62	.	,	?	"	N
had promised him a present$_{63}$	63	.	,	?	"	N
Tom said to him, $_{64}$Uncle	64	.	,	?	"	N
Ed$_{65}$ will you please buy me	65	.	,	?	"	N
a bicycle$_{66}$"	66	.	,	?	"	N
Uncle Ed said$_{67}$ "If I do	67	.	,	?	"	N
buy you a bicycle$_{68}$ will you	68	.	,	?	"	N
take good care of it?$_{69}$	69	.	,	?	"	N
In reply$_{70}$ Tom said that	70	.	,	?	"	N
he would do so$_{71}$	71	.	,	?	"	N

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 5 — Sec. B Score
(number right)

TEST 5—SECTION C

DIRECTIONS: Mark the number of the correct or better word in each sentence below.

Correct Test Booklet Mark | **Correct Ans Sheet Ma**

SAMPLE: E. She (^{1}ain't ^{2}isn't) as tall as Betty. _2_ E | E 1

In Sample E, the word in the parentheses with the 2 by it, "isn't," is the better word. Noti how the 2 has been marked.

---

72. We saw (^{1}too ^{2}two) planes in the sky above us. ______72

73. We all (^{1}sung ^{2}sang) "Happy Birthday." ______73

74. Mother and (^{1}I ^{2}me) thought Daddy looked nice. ______74

75. (^{1}That there ^{2}That) boat is the fastest on the lake. ______75

76. Where (^{1}are ^{2}is) the carrots you grew? ______76

77. All gentlemen should remove (^{1}there ^{2}their) hats. ______77

78. Just look at how those roses have (^{1}grown ^{2}grew)! ______78

79. (^{1}We ^{2}Us) players were given a fine dinner. ______79

80. Father, (^{1}can ^{2}may) I help you today? ______

81. It looked as if a child had (^{1}drawn ^{2}drew) it. ______

82. This melon was the (^{1}best ^{2}better) of the lot. ______

83. Mother has (^{1}took ^{2}taken) our coats to the cleaners. ______

84. Both Pat and Mike (^{1}wants ^{2}want) a new wagon. ______

85. We were (^{1}sitting ^{2}setting) on the lawn swing. ______

86. We had already (^{1}given ^{2}gave) to the Red Cross. ______

87. You should have (^{1}gone ^{2}went) to the circus. ______

GO RIGHT ON TO THE NEXT PAGE

TEST 5—SECTION C (Continued)

8. The pirates found nothing but (¹a ²an) empty box. ____ 88

9. That house was the (¹worse ²worst) one we saw. ____ 89

0. Father says, "A (¹mans' ²man's) house is his castle." ____ 90

1. He was almost (¹run ²ran) over by that car. ____ 91

2. (¹Haven't ²Hasn't) your mother and your father seen you play? ____ 92

3. The teacher divided the chalk (¹between ²among) the five girls. ____ 93

4. (¹He ²Him) and I met a long time ago. ____ 94

5. The birds had (¹flew ²flown) south for the winter. ____ 95

6. I'm sorry, but Mother is (¹laying ²lying) down now. ____ 96

7. (¹She ²Her) and Anne are the tallest girls in the room. ____ 97

✓ For each statement below that is a complete sentence, mark YES. For each that is not, mark NO.

98. We have been trying to see him at his home. YES NO 98

99. When the bell began to ring. YES NO 99

100. The teacher dismissed the class. YES NO 100

101. Calling good-bye to his mother and running out the door. YES NO 101

102. The girl who was the smartest in the room. YES NO 102

103. Year by year the population of the West increased. YES NO 103

104. A man who is as handsome as my father. YES NO 104

105. Near the source of the river and by the waterfall. YES NO 105

106. Calling to his friends and watching the fire as it spread. YES NO 106

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 5 — Sec. C Score (number right) ____

TEST 6

DIRECTIONS: Each line in this test contains four spelling words and the word, None. These words are numbered 1, 2, 3, 4, and the None is numbered 5. In some of the lines, one word is misspelled. In others, no word is misspelled. If there is a misspelled word, mark its number. If no word is misspelled, mark the 5.

							Correct Test Booklet Mark	Correct Answer Sheet Mark	1	2	3	4	5
SAMPLE:	F.	1 now	2 just	3 come	4 ron	5 None	4 F	F	○	○	○	●	○
SAMPLE:	G.	1 go	2 see	3 do	4 may	5 None	5 G	G	○	○	○	○	●

107.	1 built	2 beeside	3 also	4 person	5 None	______107
108.	1 always	2 court	3 fourth	4 since	5 None	______108
109.	1 pichure	2 nose	3 having	4 fairy	5 None	______109
110.	1 cart	2 shineing	3 wrap	4 lame	5 None	______110
111.	1 throw	2 whole	3 raise	4 yuong	5 None	______111
112.	1 gravy	2 living	3 iland	4 appear	5 None	______112
113.	1 human	2 dooty	3 rapid	4 cities	5 None	______113
114.	1 dollar	2 sorry	3 size	4 chane	5 None	______114
115.	1 doctor	2 mixture	3 chief	4 together	5 None	______115
116.	1 gentel	2 stain	3 merry	4 weed	5 None	______116
117.	1 quite	2 secund	3 walk	4 rule	5 None	______117
118.	1 prompt	2 period	3 serve	4 espect	5 None	______118
119.	1 forty	2 village	3 thuogh	4 lemon	5 None	______119
120.	1 many	2 feild	3 before	4 order	5 None	______120
121.	1 silk	2 excuse	3 driveing	4 wrote	5 None	______121
122.	1 mear	2 witness	3 debt	4 quarrel	5 None	______122
123.	1 empire	2 enjoy	3 degree	4 alow	5 None	______123
124.	1 screen	2 timber	3 dout	4 losing	5 None	______124
125.	1 written	2 bakeing	3 master	4 worst	5 None	______125
126.	1 sixty	2 notice	3 tablet	4 whisle	5 None	______126
127.	1 wire	2 sore	3 rabit	4 path	5 None	______127
128.	1 mouce	2 often	3 forgot	4 yellow	5 None	______128
129.	1 judgment	2 orchestra	3 referrence	4 leopard	5 None	______129
130.	1 woman	2 somwhere	3 gather	4 pipe	5 None	______130
131.	1 mileage	2 willing	3 poizon	4 cement	5 None	______131
132.	1 presume	2 recal	3 hinge	4 partner	5 None	______132
133.	1 perceive	2 overdue	3 recipe	4 sanitory	5 None	______133
134.	1 ballon	2 toad	3 fifteen	4 penny	5 None	______134
135.	1 meantime	2 handfull	3 persuade	4 skiing	5 None	______135
136.	1 attain	2 conceive	3 mutual	4 sacrafice	5 None	______136

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 6 Score (number right) ....

(The quick brown fox just came over to greet the lazy poodle.)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Grade Placement

®

California Achievement Tests

Elementary • GRADES 4-5-6 • Form W

DEVISED BY ERNEST W. TIEGS AND WILLIS W. CLARK

Name .... Last .... First .... Middle .... Grade .... (Circle one) Boy Girl

School .... City .... Date of Test .... Month .... Day .... Year

Teacher or Examiner .... ( ) Pupil's Age .... Date of Birth .... Month .... Day .... Year

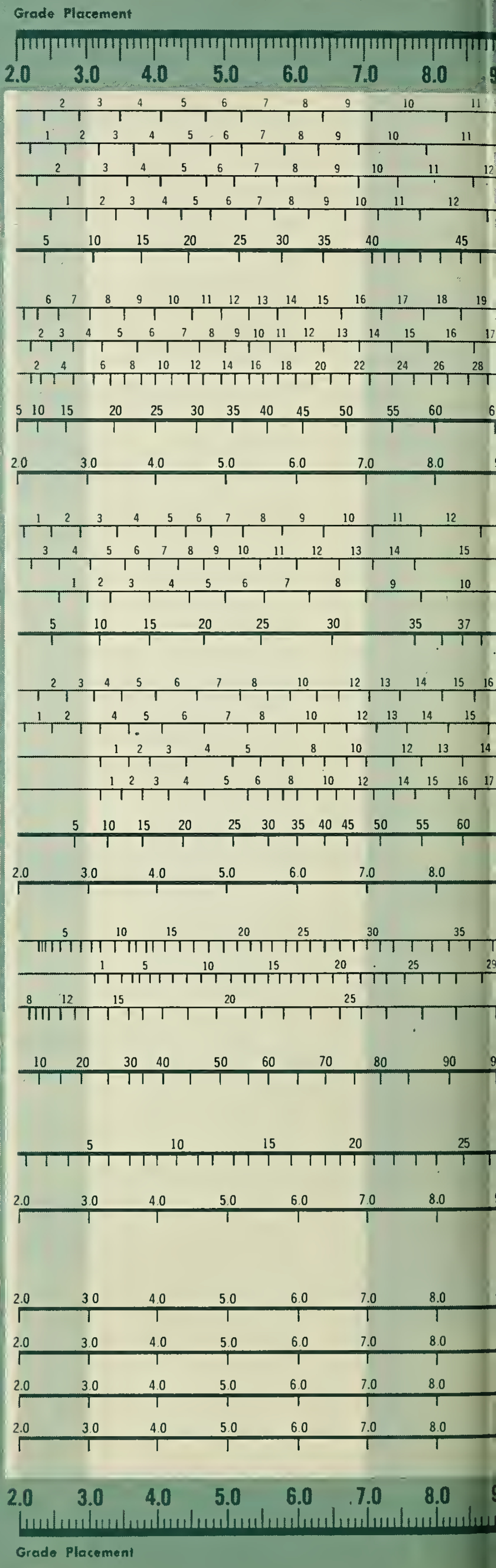
See MANUAL for instructions:

TEST	SECTION	POSSIBLE SCORE	PUPIL'S SCORE		
1. READING VOCABULARY	A. Mathematics	12			
	B. Science	13			
	C. Social Science	12			
	D. General	13			
	TOTAL (A+B+C+D)	50			
2. READING COMPREHENSION	E. Following Directions	20			
	F. Reference Skills	20			
	G. Interpretations	30			
	TOTAL (E+F+G)	70			
	READING GRADE PLACEMENT				
3. ARITHMETIC REASONING	A. Meanings	15			
	B. Signs and Symbols	15			
	C. Problems	15			
	TOTAL (A+B+C)	45			
4. ARITHMETIC FUNDAMENTALS	D. Addition	20			
	E. Subtraction	20			
	F. Multiplication	20			
	G. Division	20			
	TOTAL (D+E+F+G)	80			
	ARITHMETIC GRADE PLACEMENT				
5. MECHANICS OF ENGLISH	A. Capitalization	37			
	B. Punctuation	34			
	C. Word Usage	35			
	TOTAL (A+B+C)	106			
6. SPELLING	TOTAL SPELLING	30			
	LANGUAGE GRADE PLACEMENT				
	Handwriting				
	BATTERY GRADE PLACEMENT				
	CHRONOLOGICAL AGE GR. PL.				
	ACTUAL GRADE PLACEMENT				
	INTELL. (M.A.) GRADE PLACE.				

Grade Placement

Percentile Rank

DIAGNOSTIC PROFILE* (Chart Pupil's Scores Here



*For an interpretation of green area within Profile, see discussion on Articulation in Part 4 of Manual.

†Column designed for recording Expected Grade Placements, An Grade Placements, School or Class Averages, etc. See Part 2 of

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Junior High Level • GRADES 7 - 8 - 9 • Form W

California Achievement Tests
Complete Battery

READING — ARITHMETIC — LANGUAGE

W X Y Z SERIES

DEVISED BY ERNEST W. TIEGS AND WILLIS W. CLARK

J
H
W

INSTRUCTIONS TO STUDENTS:

This is a test of your achievement in reading, arithmetic, and language. In taking the first part you will show how many words you know and how well you understand what you read. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

1957 EDITION

15th Printing

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DIRECTIONS: Mark as you are told the number of the word that means the opposite or about the opposite of the first word.

SAMPLE: A. large ^{1} rich ^{2} small ^{3} gone ^{4} away

Correct Test Booklet Mark: 2 A

Correct Answer Sheet Mark: 1 2 3 4
A ⁞ ▍ ⁞ ⁞

TEST 1—SECTION A

1. reduce ^{1} diet ^{2} subtract ^{3} change ^{4} increase —— 1

2. curve ^{1} passage ^{2} straight ^{3} relate ^{4} temper —— 2

3. latitude ^{1} name ^{2} exist ^{3} connective ^{4} longitude —— 3

4. wholesale ^{1} discordant ^{2} retail ^{3} clever ^{4} pleasant —— 4

5. minimum ^{1} maximum ^{2} small ^{3} separate ^{4} stanza —— 5

6. purchase ^{1} spoke ^{2} sale ^{3} market ^{4} cloud —— 6

7. surface ^{1} interior ^{2} lodge ^{3} distant ^{4} action —— 7

8. simplify ^{1} divide ^{2} reduce ^{3} complicate ^{4} sanction —— 8

9. measure ^{1} estimate ^{2} length ^{3} proceed ^{4} succeed —— 9

10. concave ^{1} flaw ^{2} caramel ^{3} discretion ^{4} convex —— 10

11. annex ^{1} separate ^{2} casket ^{3} balloon ^{4} adult —— 11

12. irregular ^{1} ashore ^{2} hymn ^{3} systematic ^{4} countenance —— 12

13. cancel ^{1} retreat ^{2} record ^{3} edge ^{4} zero —— 13

14. coincide ^{1} enter ^{2} ignore ^{3} diverge ^{4} proclaim —— 14

15. assessment ^{1} reduction ^{2} efface ^{3} dividend ^{4} loom —— 15

GO RIGHT ON TO THE NEXT SECTION

Test 1 — Sec. A Score (number right) ....

TEST 1—SECTION B

16. solid ^{1} old ^{2} fluid ^{3} wise ^{4} square —— 16

17. external ^{1} element ^{2} sterile ^{3} accidental ^{4} internal —— 17

18. root ^{1} stem ^{2} food ^{3} ground ^{4} green —— 18

19. increase ^{1} ascend ^{2} refer ^{3} reduce ^{4} produce —— 19

20. muscular ^{1} modish ^{2} brine ^{3} punctual ^{4} weak —— 20

21. positive ^{1} external ^{2} rafter ^{3} negative ^{4} separate —— 21

22. brittle ^{1} unsocial ^{2} flexible ^{3} homely ^{4} profound —— 22

23. constant ^{1} attack ^{2} variable ^{3} grade ^{4} stuff —— 23

24. partial ^{1} complicate ^{2} preserve ^{3} decrease ^{4} complete —— 24

25. diverge ^{1} shorten ^{2} converge ^{3} stabilize ^{4} permit —— 25

26. confine ^{1} charge ^{2} hold ^{3} free ^{4} slight —— 26

27. repel ^{1} attract ^{2} poisonous ^{3} motto ^{4} staple —— 27

28. discard ^{1} dedicate ^{2} consume ^{3} obtain ^{4} obligate —— 28

29. transparent ^{1} shawl ^{2} studied ^{3} inclination ^{4} opaque —— 29

30. extract ^{1} inject ^{2} pollute ^{3} retract ^{4} interrupt —— 30

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 1 — Sec. B Score (number right) ....

DIRECTIONS: Mark as you have been told the number of the word that means the opposite or about the opposite of the first word.

SAMPLE: B. large ^{1} rich ^{2} small ^{3} gone ^{4} away

Correct Test Booklet Mark: 2 B

Correct Answer Sheet Mark: B 1 ⁞ 2 ❙ 3 ⁞ 4 ⁞

TEST 1—SECTION C

31. **protect** ^{1} join ^{2} attack ^{3} save ^{4} stand ____ 31

32. **advance** ^{1} retreat ^{2} raise ^{3} combat ^{4} carry ____ 32

33. **produce** ^{1} principal ^{2} director ^{3} destroy ^{4} record ____ 33

34. **majority** ^{1} minority ^{2} equity ^{3} beggar ^{4} forge ____ 34

35. **progress** ^{1} slide ^{2} halt ^{3} jump ^{4} throw ____ 35

36. **liberty** ^{1} glory ^{2} captivity ^{3} manufacture ^{4} standard ____ 36

37. **immigrate** ^{1} sharpen ^{2} change ^{3} smooth ^{4} emigrate ____ 37

38. **charitable** ^{1} moral ^{2} strange ^{3} attentive ^{4} selfish ____ 38

39. **dissolve** ^{1} organize ^{2} county ^{3} scorn ^{4} bought ____ 39

40. **abolish** ^{1} repel ^{2} establish ^{3} purify ^{4} defeat ____ 40

41. **frigid** ^{1} strong ^{2} flat ^{3} stiff ^{4} torrid ____ 41

42. **worship** ^{1} proclaim ^{2} territory ^{3} draft ^{4} scoff ____ 42

43. **prohibition** ^{1} minion ^{2} reduction ^{3} toleration ^{4} phosphorus ____ 43

44. **information** ^{1} union ^{2} exemption ^{3} ignorance ^{4} courageous ____ 44

45. **servitude** ^{1} independence ^{2} hobby ^{3} displeasure ^{4} commotion ____ 45

GO RIGHT ON TO THE NEXT SECTION

Test 1 — Sec. C Score (number right) ....

TEST 1—SECTION D

46. **definite** ^{1} indefinite ^{2} gobble ^{3} indulge ^{4} escort ____ 46

47. **unusual** ^{1} assure ^{2} meadow ^{3} common ^{4} drown ____ 47

48. **comedy** ^{1} card ^{2} tragedy ^{3} river ^{4} join ____ 48

49. **statement** ^{1} praise ^{2} parrot ^{3} shine ^{4} question ____ 49

50. **stupid** ^{1} final ^{2} effect ^{3} witty ^{4} origin ____ 50

51. **abbreviate** ^{1} fasten ^{2} hasten ^{3} burn ^{4} elongate ____ 51

52. **masculine** ^{1} feminine ^{2} peasant ^{3} man ^{4} length ____ 52

53. **introduction** ^{1} conclusion ^{2} whole ^{3} middle ^{4} height ____ 53

54. **shrill** ^{1} ashen ^{2} faint ^{3} aria ^{4} naive ____ 54

55. **criticism** ^{1} infest ^{2} coupling ^{3} feud ^{4} commendation ____ 55

56. **sacrifice** ^{1} create ^{2} negative ^{3} vocal ^{4} decline ____ 56

57. **sanction** ^{1} allow ^{2} decide ^{3} restrain ^{4} abject ____ 57

58. **subtle** ^{1} strange ^{2} obvious ^{3} old ^{4} sweet ____ 58

59. **distinct** ^{1} frigid ^{2} definite ^{3} obscure ^{4} identified ____ 59

60. **happiness** ^{1} jollity ^{2} height ^{3} immensity ^{4} pathos ____ 60

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 1 — Sec. D Score (number right) ....

DIRECTIONS: Read the following directions. Mark as you are told the number or letter of each correct answer.

61. Read these letters of the alphabet:

o p q r s t u v w x y z

Select the letter of the alphabet which appears three letters before **w.** Mark the number which shows the correct letter.

1 **t**
2 **u**
3 **r**
4 **y**
——61

62. Read the following names:

Mary Louis Roger Elizabeth

Mark the number which shows the first letters of the boys' names.

1 **ML**
2 **RE**
3 **LR**
4 **ME**
——62

63. Nouns ending in **y**, when the **y** is preceded by a vowel, form the plural regularly by adding **s**, such as **monkey, monkeys.** Mark the number of the word which indicates the correct plural of the noun **donkey.**

1 **donkeys**
2 **donkey**
3 **donkies**
4 **donkey's**
——63

64. Read these numbers:

5 1 0 6 7 4 5 9 8 0

Mark the letter of the third number after 6.

a **1**
b **5**
c **7**
d **9**
——64

65. Latitude is the measure of distance north or south from the equator. Mark the letter of the following ship's reading which indicates latitude.

a **8° 2′ 20″ W**
b **2° 48′ 10″ N**
c **10° 19′ 30″ E**
——65

66. **American** is the proper adjective derived from the proper noun **America.** Mark the number of the word which is the proper adjective of the proper noun **Arabia.**

1 **Arabia's**
2 **Arabia**
3 **Araban**
4 **Arabian**
——66

67. The suffix **al** added to a noun is used to form some adjectives, such as **accident, accidental.** Mark the number of the adjective correctly formed from the noun **monument.**

1 **monument**
2 **monumentally**
3 **monuments**
4 **monumental**
——67

GO RIGHT ON TO THE NEXT PAGE

68. Four words are listed below. Select the one word that would be listed last in a dictionary. Mark the number of the correct word.

^{1} **reliance**
^{2} **religious**
^{3} **relinquish**
^{4} **reliable** ______68

69. The stem word is that part of the word which is present in all variations of the word, such as the stem word **neat** in **neater** and **neatest.** Mark the number of the word which is the stem in the following words.

^{1} **faction**
^{2} **fact**
^{3} **factor**
^{4} **facts** ______69

✓ Look at the following recipe and find the answers to questions 70 and 71.

2 cups flour
$\frac{1}{2}$ cup shortening
1 teaspoon salt
$\frac{3}{4}$ cup milk
2 teaspoons baking powder

Take the flour, salt, and baking powder and sift together; mix in the shortening thoroughly; add the milk; roll the dough out about one-half inch thick and cut with a biscuit cutter. Bake in a hot oven about twelve minutes.

70. In the recipe you have just read, select the process that was used to cook the biscuits. Mark the number of the correct word listed below.

^{1} **boil**
^{2} **mix**
^{3} **roast**
^{4} **bake** ______70

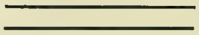
71. Mark the number of the item which is the fourth ingredient to be used in mixing the above recipe.

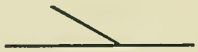
^{1} **milk**
^{2} **shortening**
^{3} **salt**
^{4} **baking powder** ______71

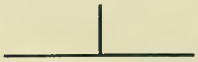
72. The area of a triangle is found by multiplying $\frac{1}{2}$ the base by the altitude. Mark the letter of the number of square feet in a triangle whose base is 4 feet and whose altitude is 3 feet.

^{a} **6**
^{b} **12**
^{c} **4**
^{d} **2** ______72

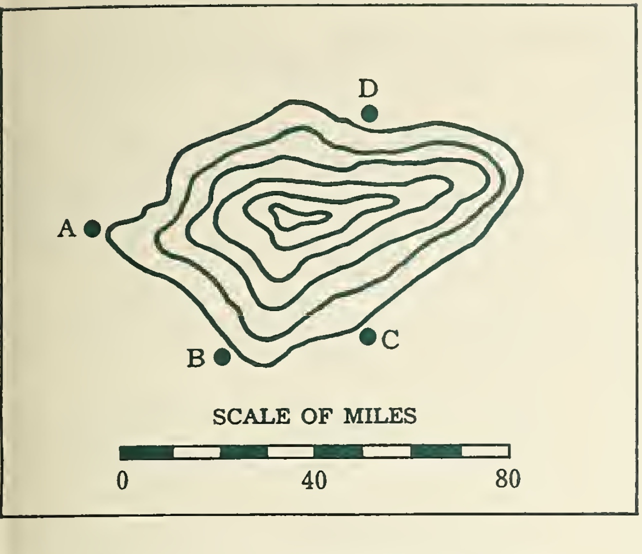
73. Two lines drawn so that they form right angles are said to be perpendicular to each other. Two lines drawn so they cannot meet are said to be parallel lines. Diagonal lines are lines drawn at any angle except right angles to each other. Determine which one of the following pairs of lines is perpendicular and mark its number.

1 

2 

3  ______73

GO RIGHT ON TO THE NEXT PAGE



74. The scale of miles shown in the above drawing is forty miles to one inch. Determine the distance from point A to C. Mark the number which shows the correct mileage below.

- 1 **twenty miles**
- 2 **forty miles**
- 3 **eighty miles**
- 4 **sixty miles**

______74

75. To find the length of the diagonal line in a rectangle, add the square of the base to the square of the altitude and then extract the square root of this sum. Mark the letter which indicates the length in inches of the diagonal of a rectangle whose base is 8 inches and whose altitude is 6 inches. (Eight squared is 64, 6 squared is 36, and 10 squared is 100.)

- a **6**
- b **8**
- c **10**
- d **36**

______75

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 2 — Sec. E Score
(number right)

TEST 2—SECTION F

DIRECTIONS: Mark as you have been told the number or letter of each correct answer.

76. The introduction is found in what part of a book?

- 1 **beginning**
- 2 **middle**
- 3 **end** ______76

77. In what part of a book would the author's name appear?

- 1 **glossary**
- 2 **title page**
- 3 **index**
- 4 **appendix** ______77

78. A preface is found in what part of a book?

- 1 **before the table of contents**
- 2 **immediately after the table of contents**
- 3 **in the first chapter**
- 4 **in the summary** ______78

79. Mark the number of the following article or section in a newspaper which is presented primarily to state an opinion.

- 1 **the weather chart**
- 2 **the lead news story**
- 3 **the editorial**
- 4 **the stock market report** ______79

80. The guide words **portray** and **possible** appear at the top of the page in one dictionary. Mark the number of the word that would *not* be found on this page.

- 1 **portrait**
- 2 **positive**
- 3 **position**
- 4 **possessive** ______80

✓ Look at this partial index and find th answers to questions 81, 82, and 83.

INDEX

Egypt: agriculture, 261; climate, 254; educa
tion, 291; defense, 302; financial manage
ment of, 314; government of, 347; indus
tries of, 284; irrigation in, 258; problem
of trade in, 321.

Egyptian architecture, important periods of
380.

Egyptian language: classical dialects, 393
consonants in, 392; pictographs, 390.

Egyptian temples: plans of, 401; relation t
religious beliefs, 413; rites conducted, 415

Egyptian tombs, 422.

81. Mark the letter of the page on which information concerning rites conducted in connection with Egyptian temples will be found.

- a **401**
- b **413**
- c **415**
- d **422** ______8

82. Mark the letter of the page on which information concerning the government of Egypt will be found.

- a **291**
- b **302**
- c **321**
- d **347** ______8

83. Information concerning the value of the Nile River in Egypt will be found on what page? Mark the letter of the page.

- a **254**
- b **258**
- c **268**
- d **284** ______8

GO RIGHT ON TO THE NEXT PAGE

TEST 2—SECTION F (Continued)

✓ **Look at the following Table of Contents and answer questions 84, 85, and 86.**

TABLE OF CONTENTS

Chapter	Page
1. The Demand for Coffee	1
2. Coffee Plantations	6
3. Growth of Coffee	19
4. Preparation for the Market	35
5. Coffee Ports	57
6. World's Trade in Coffee	65

84. Mark the letter of the page on which "Preparation for the Market" begins.

a **6**
b **35**
c **57**
d **19** ______84

85. Mark the letter of the chapter in which the material on page 59 will be found.

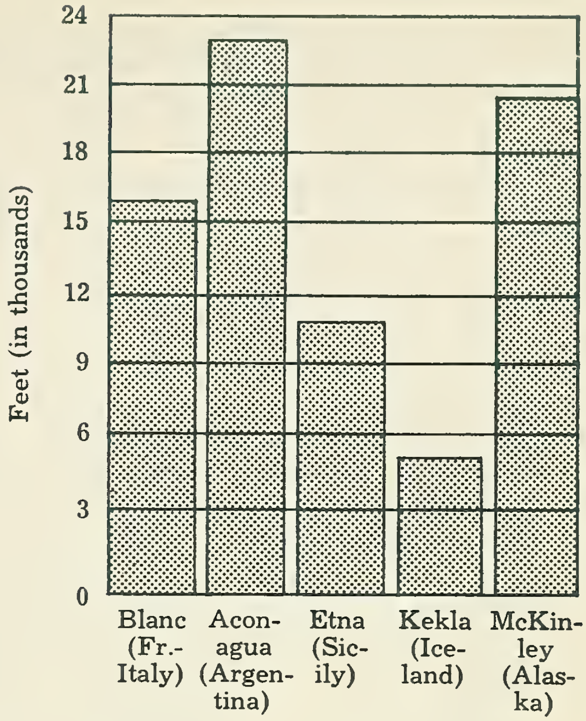
a **Coffee Ports**
b **Preparation for the Market**
c **Growth of Coffee**
d **Coffee Plantations** ______85

86. In which chapter will the best account concerning the supply of coffee from South America be found?

a **Chapter 1**
b **Chapter 3**
c **Chapter 4**
d **Chapter 6** ______86

✓ **Look at the graph at the top of the next column and indicate the correct answers to questions 87 through 90.**

ALTITUDE IN FEET
OF FIVE MOUNTAINS



87. In which country is the lowest of the five peaks located?

1 **Argentina**
2 **Sicily**
3 **Iceland**
4 **Alaska** ______87

88. Mt. Etna is lower than Mt. Blanc but it is higher than

1 **Mt. McKinley.**
2 **Mt. Kekla.**
3 **Mt. Aconagua.**
4 **the others.** ______88

89. The elevation of Mt. McKinley is closest to

a **20,000 ft.**
b **20 ft.**
c **5000 ft.**
d **16,000 ft.** ______89

90. The combined height of the three highest peaks is approximately

a **49,000 ft.**
b **53,000 ft.**
c **63,000 ft.**
d **59,000 ft.** ______90

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✓ **Look at these classification numbers selected from the Dewey Decimal System, and find the answers to questions 91 and 92.**

608	Inventions and Inventors
629	Aviation
930	World History
973	United States History

91. Information concerning the Santa Fe Trail to California will be found in which classification? Mark the correct letter.

a **608**
b **973**
c **930**
d **629** ——91

92. A nonfiction book concerning Eli Whitney will be found in which classification? Mark the correct letter.

a **973**
b **930**
c **629**
d **608** ——92

✓ **Decide which are the TWO best topics to look up in an encyclopedia or reference book for information on the following subjects. Mark the numbers of these two topics.**

SAMPLE C: Skating in Holland

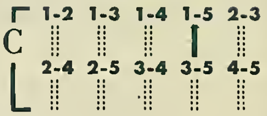
1 **Skating**
2 **Wrestling**
3 **Baseball**
4 **Football**
5 **Recreation in Holland**

Answers to Sample C:

Correct Test Booklet Mark

1-5 C

Correct Answer Sheet Mark



93. Cotton Growing in Louisiana

1 **Spinning**
2 **Weaving**
3 **Cotton**
4 **Louisiana**
5 **The Cotton Gin** ——9

94. Cattle Raising in Texas

1 **Texas**
2 **Animals**
3 **Cattle**
4 **Farming**
5 **Meat** ——9

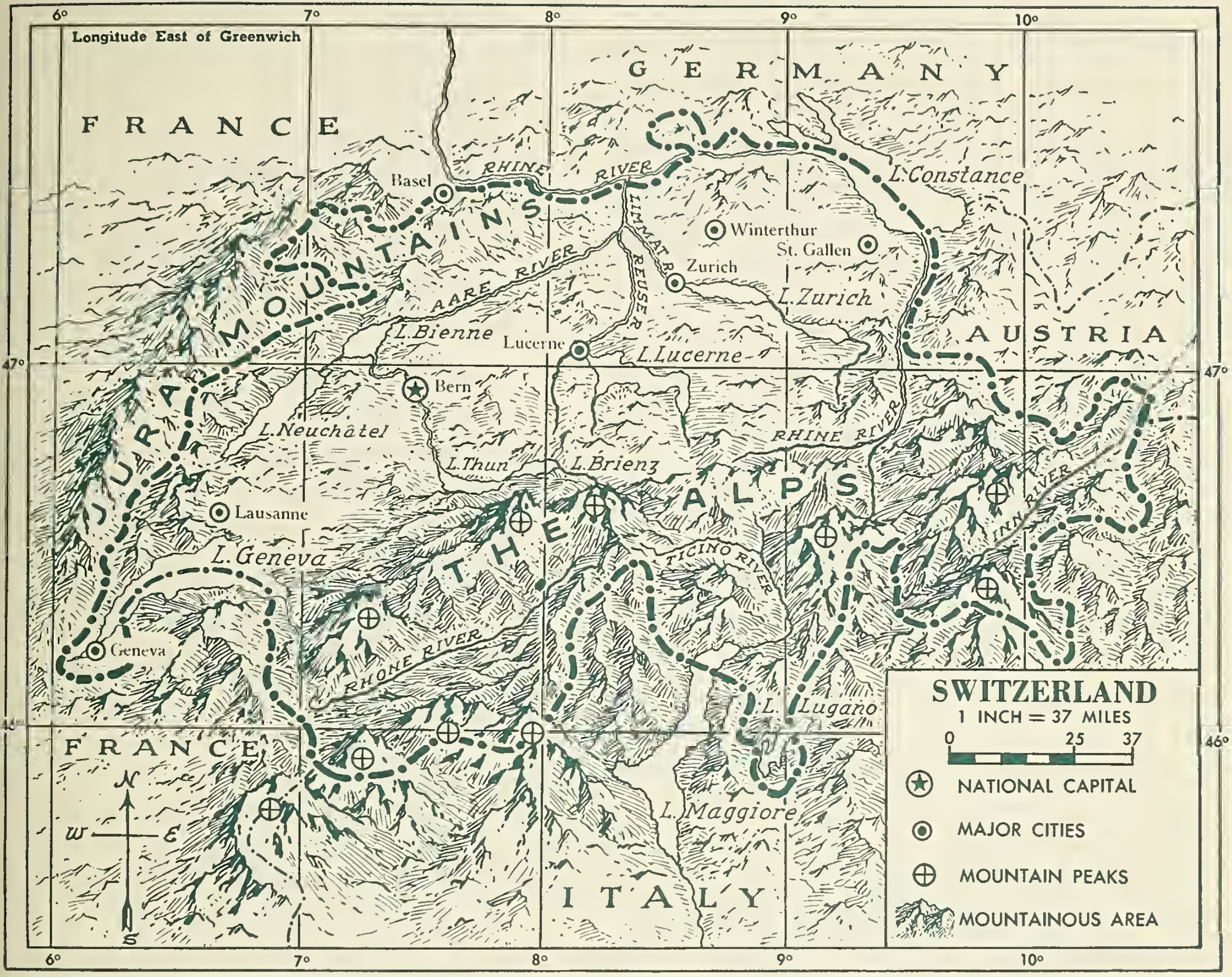
95. The Football Game in America

1 **Schools**
2 **Leagues**
3 **Football**
4 **Games**
5 **America** ——9

96. Destructive Insects in the Cotton Industry

1 **Agriculture**
2 **Industry**
3 **Cotton**
4 **Destruction**
5 **Pests** ——96

GO RIGHT ON TO THE NEXT PAGE



✓ **Look at the map and indicate the correct answers to questions 97 through 101.**

97. One of the following rivers flows through Lake Constance. Which one is it?

1 **Rhine**
2 **Aare**
3 **Rhone**
4 **Limmat** ______ 97

98. The west end of Lake Constance is located near what degree of longitude?

a **9° E**
b **10° E**
c **47° E**
d **48° E** ______ 98

99. Which of the following regions is *not* to be found in Switzerland?

1 **central plateau**
2 **coastal plain**
3 **mountain range**
4 **lake region** ______ 99

100. One of the rivers draining the central plateau is the

1 **Rhone.**
2 **Inn.**
3 **Ticino.**
4 **Aare.** ______ 100

101. The Rhine and the Rhone Rivers have their sources in one of the following areas. Mark the number of the correct area.

1 **Lake Constance**
2 **Lake Geneva**
3 **Jura Mountains**
4 **The Alps** ______ 101

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 2 — Sec. F Score
(number right)

TEST 2—SECTION G

✓ **Read this story:**

To catch fish, men were required to learn the use of ships and the ways of the sea. All countries that border the sea have merchant ships, and naval vessels for their national defense. Many of the crew members of these ships gained training and experience with fishing fleets.

Not all fish are marketed to be eaten fresh. Some kinds are canned, some dried and salted, and some are pickled. The value of the fish canned in the United States and Alaska in one recent year was $339,000,000. Of this sum Alaska, Washington, Oregon, and California are credited with over $139,000,000. The fish canned on the Pacific Coast are mostly salmon, sardines, and tuna fish or albacore. Salmon are packed in cans of varying weight, but the output of canned salmon alone (largely from the state of Washington) in a recent year was equal to nearly 5,525,000 cases of 48 one-pound cans, having a value of about $103,000,000.

The fishing industry furnishes a number of valuable products other than food. Among the more important are fish meal, oil, amino acids, pearls, glue, fertilizer, and leather. During the same year the value of these by-products was more than $115,000,000.

For years the United States exported only small quantities of fish because our cost of production was greater than that of European countries. However, during and after World War II, the value of exports increased and they exceeded $34,000,000 in a recent year. Canned salmon and sardines make up a very large part of our fish exports.

✓ **Mark as you have been told the letter or number of each correct answer. You may look back to find the answers.**

102. Besides providing food, fish furnish

- ᵃ **perfume.**
- ᵇ **oils.**
- ᶜ **metals.**
- ᵈ **nothing.** ____102

103. By-products of the fishing industry means

- ¹ **dried fish.**
- ² **pickled fish.**
- ³ **canned fish.**
- ⁴ **products other than food.** ____103

104. The value of fish canned in the U. S. and Alaska in a recent year was about

- ¹ **$100,000,000.**
- ² **$140,000,000.**
- ³ **$340,000,000.**
- ⁴ **$34,000,000.** ____104

105. The fishing industry contributes to national defense by helping to train men for the

- ¹ **Army.**
- ² **Navy.**
- ³ **Air Force.**
- ⁴ **Marines.** ____105

106. One fish not usually canned on the Pacific Coast is

- ¹ **albacore.**
- ² **tuna.**
- ³ **the sardine.**
- ⁴ **haddock.** ____106

107. Salmon is packed in cans weighing

- ¹ **different amounts.**
- ² **48 pounds.**
- ³ **one-half pound.**
- ⁴ **one pound.** ____107

108. Compared with the value of all other fish canned on the West Coast, salmon ranks

- ¹ **low.**
- ² **average.**
- ³ **first.**
- ⁴ **second.** ____108

GO RIGHT ON TO THE NEXT PAGE

109. Compared with the wages of fishermen in the United States, the wages of European fishermen have been

[1] **higher.**
[2] **about the same.**
[3] **lower.**
[4] **extravagant.** ____109

✓ **Read this story:**

Cotton consists of the fibers attached to the seeds of the cotton plant. After the cotton is picked it is separated from the seeds in a cotton gin and then pressed into bales. Fibers are twisted into thread, and the thread or cotton yarn is then used for making cloth.

Cotton has been made into cloth for thousands of years. Indeed, no one knows when or where it was first used. The plant was growing in America at the time of the voyages of Columbus, but it was known and used in Asia and Africa thousands of years earlier. It was probably first grown and woven into cloth in India.

Records for one year show that the number of bales of cotton produced in different states of the United States was as follows:

States	Number of Bales	Per Cent
Texas	4,317,000	26.2
Mississippi	2,129,000	12.9
California	1,768,000	10.8
Arkansas	1,548,000	9.4
Alabama	963,000	5.8
Georgia	752,000	4.6
Others	4,988,000	30.3
Total	16,465,000	100.0

Cotton provides us with many useful products. The oil obtained from the seed is used in lard compounds, oleomargarine, salad oils, packing fish, making soap, and for many other purposes. The cake which remains after the oil has been pressed from the seed makes excellent cattle feed and fertilizer. While the value of the seed is less than that of the fiber, it nevertheless constitutes a considerable portion of the farmer's income.

✓ **Mark the number or letter of each correct answer. You may look back to find the answers.**

110. Present day uses of the cotton plant have increased the farmer's income because

[1] **more parts are salable.**
[2] **cotton is now in short supply.**
[3] **of the need for nylon.**
[4] **fibers are better.** ____110

111. One of the most important products of cotton is

[1] **wood.**
[2] **cotton candy.**
[3] **gun cotton.**
[4] **cottonseed oil.** ____111

112. The annual production of cotton in places listed as "Others" is about what per cent of the total yield?

[a] **6%**
[b] **7%**
[c] **13%**
[d] **30%** ____112

113. In one year, about 9 per cent of the cotton was produced in

[1] **Arkansas.**
[2] **Alabama.**
[3] **Oklahoma.**
[4] **Georgia.** ____113

114. The best title for this story is

[1] **"Origin of Cotton."**
[2] **"By-products of Cotton."**
[3] **"Records."**
[4] **"Cotton."** ____114

GO RIGHT ON TO THE NEXT PAGE

115. Compared with the money value of cottonseed oil, cotton fiber is worth

^{1} **about the same.**
^{2} **more.**
^{3} **less.**
^{4} **very little.** ______115

116. About what per cent of the total number of bales was produced in the two leading states? Mark the letter of the correct number.

^{a} **24%**
^{b} **36%**
^{c} **39%**
^{d} **56%** ______116

✓ **Read this story:**

SWEDEN

Sweden, located in northwestern Europe, occupies the eastern and larger part of the Scandinavian Peninsula. It is bordered on the west by Norway, on the northeast by Finland, on the east by the Gulf of Bothnia, on the east and south by the Baltic Sea, and on the southwest by the Kattegat. Sweden extends for about 970 miles from north to south and about 200 miles from east to west, being 300 miles at its widest point. The largest of its numerous islands, which border the coastline, are the two Baltic islands of Gotland and Öland.

Much of Sweden is a tableland sloping from the Kjölen Range on the west to the Baltic. This mountainous western frontier reaches 6,965 feet in its highest peak, the Kebnekaise. The hilly central plateau slopes down to the eastern coast to form a narrow coastal plain along the Gulf of Bothnia. The many rivers, such as the Lule, the Dal, and the Ångerman, run in a southeasterly direction. The southern part of Sweden is generally low and level, rising to a low plateau. In this region, Sweden's largest lakes, Väner and Vätter, several smaller lakes, the Göta and other rivers, and short canal sections form the Göta Canal System. This is the major east-west waterway of Sweden. No less than 8 per cent of the surface of Sweden is water, the immense number of lakes covering almost 15,000 square miles.

The country is divided into three large regions. The southern tip of the peninsula is called Götaland. To the north of Götaland, but still in the southern third of Sweden, is Svealand. The major population centers of Sweden are located in Svealand and Götaland. Norrland occupies the northern two thirds of the country. This section is drained by numerous large rivers which provide hydroelectric power on a large scale and are useful as major logging routes in this beautiful land of forests.

Due to the length of Sweden, the temperature from north to south varies considerably. The North, part of which lies above the Arctic Circle, has long, cold winters and short summers. The climate of southern Sweden is much like that of the state of Maine. The average rainfall for the country is about 20 inches a year. It is heaviest in the South and lightest in the North.

Sweden's sylvan slopes cover 55 per cent of the country's surface. This gives rise to its most important industries, which include lumbering, woodworking, paper, and pulp milling. On the other hand, cultivated land makes up only 9 per cent of the total area, and this is concentrated in the South where the topography encourages farming. However, intensive modern methods have resulted in high yields of crops, even though the growing season is very short due to the long winters. Sweden is world famous for its fine steel products. The enormous hydroelectric power generated in Norrland, as well as in the South, has given an impetus to manufacturing industries. Chief products, in addition to those already mentioned, include textiles, chemicals, munitions, and matches. Sweden's merchant marine carries cargo to all parts of the world. The major cities of Sweden are its capital, Stockholm, its chief seaport, Göteborg, and the southern metropolis, Malmö.

GO RIGHT ON TO THE NEXT PAGE

✓ **Mark the letter or number of each correct answer. You may look back to find the answers.**

117. The highest peaks of the Kjölen Range reach a height of about

a 7,000 feet above sea level.
b 5,000 feet above sea level.
c 4,000 feet above sea level.
d 2,000 feet above sea level. ______117

118. The rivers of northern Sweden are able to supply power because

1 they are long.
2 they are calm.
3 they are free from ice.
4 they are swift moving. ______118

119. Sweden's chief source of income is

1 lumber products.
2 tourist trade.
3 agriculture.
4 mining. ______119

120. The area receiving the greatest rainfall in Sweden is

1 the North.
2 the South.
3 the mountain area.
4 the Bothnian coastline. ______120

121. A region is best described as a

1 border.
2 section.
3 country.
4 peninsula. ______121

122. Farmers in Sweden have increased their incomes by

1 planting oftener.
2 scientific methods.
3 working harder.
4 using greater varieties of crops. ______122

123. Most of Sweden's forests are found in

1 Norrland.
2 Götaland.
3 the lake region.
4 Svealand. ______123

124. What fraction of Sweden's area is *not* under cultivation?

1 one fourth
2 one half
3 three fourths
4 nine tenths ______124

125. The word "sylvan" is best described as meaning

1 gentle.
2 beautiful.
3 wooded.
4 silvery. ______125

✓ **Read this story:**

The Mayflower, in which the Pilgrims came to America, was the typical sailing vessel of its time. It was a three-masted ship, one hundred feet long and twenty-five feet wide. As late as the beginning of the nineteenth century the ships owned by merchants, lumbermen, and fishermen were of the same type as the colonial Mayflower.

In the middle of the nineteenth century, England began using steamships and iron vessels which soon outclassed the colonial-type sailing vessel. In order to maintain a place in the competitive shipping industry, it was necessary for the Americans to build some sort of ship that was faster and easier to handle. This resulted in the American "clipper ship," which for a time was able to compete successfully with the English ships. With the further development of steamships, however, this type of vessel was also hopelessly outclassed.

GO RIGHT ON TO THE NEXT PAGE

TEST 2—SECTION G (Continued)

In the succeeding years, ships increased in size as well as in luxury. The Mauretania, launched in 1908, was considered a marvel because it weighed nearly 30,700 tons. It held the transatlantic speed record of five and one-half days for twenty years. Each year, however, brought changes in ships, with increased weight and speed, until the Bremen was built and crossed the Atlantic in nine hours less time than the previous record holder. Later the Queen Mary and the Normandie exceeded that record by about 24 hours. The present record is held by the S. S. United States.

✓ **Mark the number or letter of each correct answer. You may look back to find the answers.**

126. In the 19th century the Americans built the

1 **clipper ships.**
2 **Mayflower.**
3 **Bremen.**
4 **Mauretania.** ______126

127. American shipping was stimulated through competition with

a **Italy.**
b **Germany.**
c **Japan.**
d **England.** ______127

128. Commercial vessels superior to the colonial-type sailing ship were first introduced by

1 **the English.**
2 **the Pilgrims.**
3 **fishermen.**
4 **the Americans.** ______128

129. The Mauretania held the Atlantic crossing record until a new record was established by the

a **Queen Mary.**
b **Bremen.**
c **Normandie.**
d **Ile de France.** ______129

130. The "clipper ship" was able to compete successfully because it was

1 **a steamship.**
2 **a passenger ship.**
3 **easier to handle.**
4 **a sailing vessel.** ______130

131. The Bremen crossed the Atlantic in about

a **9 days.**
b **7 days.**
c **6 days.**
d **5 days.** ______131

132. At the beginning of the nineteenth century, the typical commercial ship used was

a **a clipper ship.**
b **three-masted.**
c **an iron ship.**
d **a steamship.** ______132

133. The improved size and speed of the modern steamship has had many effects on the world. Which of the following changes has *not* occurred due to this improvement?

1 **travel time shortened**
2 **shipping and trade increased**
3 **fares and rates lowered**
4 **cargo spoilage increased** ______133

✓ **Read this story:**

THE TELEGRAPH

For eleven years Samuel Morse had been trying to interest someone in his invention of the telegraph and endured great poverty in attempting to carry out his experiments. Finally, in 1843, Congress appropriated $30,000 for this purpose, and Morse was then able to make rapid progress in the development of telegraphy.

GO RIGHT ON TO THE NEXT PAGE

In the spring of 1844, while the political parties were holding their conventions, the telegraph finally became ready for a practical tryout. Morse was able to notify the candidates and the people in Washington of the results of the conventions before they could secure this information by any other means. This aroused much public interest, and there was a general recognition of his remarkable accomplishment. From that time forward, the telegraphic system grew with astounding rapidity and covered the entire world within thirty years.

At first the telegraph was mechanically complicated, but with constant research the instruments themselves became simpler. During recent years, however, due to the complexities of modern life, the system as a whole has become somewhat involved. Every city has an intricate system of telegraph wires below the surface of the streets, and even the continents are connected by cables laid on ocean floors.

The development of the telegraph brought the world closer together by providing a method of bringing ideas and messages from the entire world within the reach of all in a minimum of time. This process has been greatly accelerated by recent improvements in wireless telegraphy, radio, and television.

✓ **Mark the letter or number of each correct answer. You may look back to find the answers.**

134. Bringing the world closer together means

[a] **fewer time zones.**
[b] **maps must be redrawn.**
[c] **better communications.**
[d] **crowded conditions.** ____134

135. An appropriation consists of

[1] **congratulations.**
[2] **money.**
[3] **inventions.**
[4] **patents.** ____135

136. The telegraph became world wide in its coverage

[1] **by 1875.**
[2] **by 1912.**
[3] **after the development of wireless telegraphy.**
[4] **by 1844.** ____136

137. An intricate system is

[1] **complicated.**
[2] **antique.**
[3] **radical.**
[4] **unique.** ____137

138. Telegraph poles in cities

[1] **are similar to telephone poles.**
[2] **are taller than telephone poles.**
[3] **are used for electric power also.**
[4] **don't exist.** ____138

✓ **Read the eight statements below. You are to select the one that would make the best title for each of the four paragraphs of the story. You may look back to find the answers.**

STATEMENTS

1. Wide use of telegraphy
2. Communication of words
3. The inventor's struggle
4. Congress and elections
5. Effects of telegraphy
6. Ideas and messages
7. The practical demonstration
8. Necessity

139. The best title for the first paragraph is statement

1. 2. 3. 4. 5. ____139

140. The best title for the second paragraph is statement

4. 5. 6. 7. 8. ____140

GO RIGHT ON TO THE NEXT PAGE

TEST 2—SECTION G (Continued)

141. The best title for the third paragraph is statement

1. 2. 3. 4. 5. ____141

142. The best title for the fourth paragraph is statement

4. 5. 6. 7. 8. ____142

The following things are mentioned in the story:

Complex system
Mechanically complicated instruments
Wireless telegraphy
Simpler instruments

The order in which these things are mentioned in the story is as follows:

143. Complex system was

1st. 2nd. 3rd. 4th. ____143

144. Mechanically complicated instruments was

1st. 2nd. 3rd. 4th. ____144

145. Wireless telegraphy was

1st. 2nd. 3rd. 4th. ____145

146. Simpler instruments was

1st. 2nd. 3rd. 4th. ____146

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 2 — Sec. G Score
(number right) ....

Arithmetic

INSTRUCTIONS TO STUDENTS:

This is an arithmetic test. In taking it you will show how well you can think and work problems. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

TEST 3 — SECTION A

Do not write, mark, or figure on this test booklet unless told to do so by the examiner.

DIRECTIONS: Decide how each of the amounts below should be written as a number. Then mark as you are told the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, mark the letter, e. In taking this test you should finish the first column before going on to the second. Look at the samples to the right and see how they are marked.

Sample A: Twelve

a 10
b 12
c 11
d 2
e None

Correct Answer Sheet Mark

	a	b	c	d	e
A	⁞	▮	⁞	⁞	⁞

Correct Test Booklet Mark

b A

Sample B: Twenty

a 22
b 200
c 2
d 21
e None

Correct Answer Sheet Mark

	a	b	c	d	e
B	⁞	⁞	⁞	⁞	▮

Correct Test Booklet Mark

e B

1. Nine hundred thirty-five

a 90,035
b 9035
c 935
d 359
e None ______ (1)

2. Four thousand ten

a 40,100
b 4010
c 400010
d 40,010
e None ______ (2)

3. Forty thousand twenty-three

a 40,230
b 42,300
c 40,023
d 4230
e None ______ (3)

4. One million ten thousand eleven

a 1,001,011
b 1,000,000,10,000,11
c 1,010,011
d 1,100,011
e None ______ (4)

5. Five-eighths

a 5 – 8
b 5 + 8
c $\frac{8}{5}$
d .58
e None ______ (5)

6. Sixty-nine dollars and two cents

a $69.2¢
b 69.20
c $69.02
d 69.02
e None ______ (6)

7. Eighty-five per cent

a .85%
b 85
c 85%
d 85°
e None ______ (7)

✓ **Read these Roman numerals. Then mark as you have been told the letter of each correct answer.**

8. LX means

a 40
b 90
c 60
d 110
e None ______ (8)

9. DC means

a 200
b 300
c 400
d 600
e None ______ (9)

10. MI means

a 501
b 1001
c 4010
d 6100
e None ______ (10)

✓ **Find the largest number, marked a, b, c, or d, in each of the following rows. Then mark its letter.**

11. **a** 39 **b** 235 **c** 172 **d** 60 ______ 11

12. **a** $89\frac{3}{4}$ **b** $66\frac{1}{2}$ **c** $106\frac{5}{6}$ **d** $55\frac{2}{3}$ ______ 12

13. **a** .025 **b** .099 **c** .75 **d** .015 ______ 13

14. **a** $\frac{5}{8}$ **b** $\frac{2}{3}$ **c** $\frac{8}{9}$ **d** $\frac{1}{20}$ ______ 14

15. **a** $\frac{5}{6}$ **b** $\left(\frac{5}{6}\right)^2$ **c** $\left(\frac{3}{4}\right)^4$ **d** $\left(\frac{7}{8}\right)^3$ ______ 15

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 3 — Sec. A Score (number right) ....

TEST 3—SECTION B

DIRECTIONS: Mark the letter or number of each correct answer. If you do not know an answer, or if you think that none of the answers given is correct, you should mark the letter, e (items 16-20), or the number, 5 (items 21-25). Finish the first column before going on to the second. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

16. $\sqrt{36}$ is

a 13
b 6
c 2401
d 18
e None

______ (16)

17. 10% of 60 =

a 600
b 70
c 6
d $\frac{1}{6}$
e None

______ (17)

18. A straight angle equals how many degrees?

a 180
b 90
c 45
d 360
e None

______ (18)

19. Which 2 numbers are both factors of 10?

a 9,1
b 2,5
c 5,4
d 8,2
e None

______ (19)

20. What is the greatest common divisor of 8, 16, and 24?

a 3
b 2
c 4
d 8
e None

______ (20)

21. π means

1 add
2 pi
3 radius
4 degree
5 None

______ (21)

22. % means

1 per cent
2 ounce
3 dram
4 reduce
5 None

______ (22)

23. V means

1 vortex
2 volume
3 angle
4 diagonal
5 None

______ (23)

24. $\sqrt{\quad}$ means

1 add
2 ounce
3 interest
4 square root
5 None

______ (24)

25. △ means

1 square
2 pyramid
3 rectangle
4 circle
5 None

______ (25)

DIRECTIONS: Some rules and formulas used in measurement, numbered 1, 2, 3, 4, and 5, are given to the right below. Some problems that can be worked with them are given on the left, numbered 26, 27, 28, 29, and 30. Mark the number of the rule or formula on the right which is used to find the answer to each problem on the left.

Problems	Rule or Formula
26. Area of a triangle	______ 26
27. Diameter of a circle	______ 27
28. Area of a parallelogram	______ 28
29. Area of a cube	______ 29
30. Hypotenuse of a right triangle	______ 30

Rules and Formulas Used in Measurement

1. $6s^2$
2. Obtain the square root of the sum of the squares of the two sides.
3. $\frac{C}{\pi}$
4. Multiply base by height.
5. $\frac{1}{2}$ hb

GO RIGHT ON TO THE NEXT PAGE

DIRECTIONS: Work these problems. Then mark as you have been told the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Finish the first column before going on to the second. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

31. Add:
$$\begin{array}{r} 46 \\ -22 \\ 31 \\ \hline \end{array}$$

a 99
b 7
c 55
d 59
e None

_____ (31)

32. Subtract:
$$\begin{array}{r} 89\ b \\ 26\ b \\ \hline \end{array}$$

a 63
b 63b
c $63b^2$
d −63b
e None

_____ (32)

33. The minuend is 7; the subtrahend is 13; the difference is

a −6
b 20
c 92
d 6
e None

_____ (33)

34. Multiply: 6(−7)

a 13
b 42
c −42
d −13
e None

_____ (34)

35. Divide: $\dfrac{-36}{6}$

a 6
b 42
c 30
d −6
e None

_____ (35)

✓ **Find the value of x in each of these equations. Then mark its letter.**

36. $5x = 45$
$x =$

a 50
b 9
c 5
d 225
e None

_____ (36)

37. $x + 8 = 11$
$x =$

a 19
b 88
c 91
d 8
e None

_____ (37)

38. $x^2 = 25$
$x =$

a $x - 5$
b 25^2
c 5
d 25
e None

_____ (38)

39. $\dfrac{x}{4} = 4$
$x =$

a 4
b 16
c 1
d $\frac{1}{16}$
e None

_____ (39)

40. If $r = 5$, $s = 6$, and $t = 4$, find the value of x in the following equation:
$x = r + s - t$
$x =$

a 7
b 15
c 10
d 11
e None

_____ (40)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 3 — Sec. B Score (number right) ....

TEST 3 — SECTION C

DIRECTIONS: Work these problems. Then mark the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

41. In a classroom there were 8 rows of desks with 6 desks in each row. Four desks were removed from the room. How many desks were left?

a 44
b 48
c 42
d 40
e None

(41)

42. Arthur bought a used automobile for $90.00. He paid $20.00 down and is to pay the rest in 10 equal payments. How much will each payment be?

a $5.50
b $9.00
c $7.00
d $2.00
e None

(42)

43. Marie weighs 90 pounds, Alice weighs 70 pounds, and Josephine weighs 110 pounds. What is their average weight in pounds?

a 90
b 100
c 110
d 80
e None

(43)

44. How many square feet are there in a strip of paper which is 4 feet wide and 11 feet long?

a 15
b 7
c 45
d 41
e None

(44)

45. Find the area of a rectangle having a base of 10 inches and an altitude of 12 inches.

a 88 sq. in.
b 102 sq. in.
c 210 sq. in.
d 120 sq. in.
e None

(45)

46. When the scale of a map is “$\frac{1}{2}$ in. = 40 mi.,” how many miles apart are 2 cities that are represented as $1\frac{1}{2}$ inches apart?

a 80
b 20
c 110
d 120
e None

(46)

47. Jack sold magazine subscriptions for $2.00 each, receiving a 25% commission on his sales. How much did he receive for each subscription sold?

a $2.25
b 50¢
c $1.75
d 25¢
e None

(47)

GO RIGHT ON TO THE NEXT PAGE

48. A box is 12 inches long, 5 inches wide, and 2 inches deep. How many cubic inches does it contain?

a 60
b 110
c 240
d 120
e None

(48)

---

49. A man received 6 per cent interest on a loan of $175 for 1 year. How much interest did he receive?

a $181.00
b $10.50
c $29.25
d $169.00
e None

(49)

---

50. Helen had $12.00 and spent $3.00 of it. What per cent did she spend?

a 30
b 25
c 12
d $33\frac{1}{3}$
e None

(50)

---

51. Henry missed 6 problems on a test but did 80% of them correctly. How many problems were there in the test?

a 30
b 86
c 74
d 68
e None

(51)

---

52. Charles, John, and Jerry together received $50.00. Charles received $12.00, John received $24.00, and Jerry received $14.00. What per cent of the $50.00 did John receive?

a 24
b 12
c 48
d 14
e None

(52)

---

53. Find the area of a triangle having a base of 10 inches and an altitude of 14 inches.

a 140 sq. in.
b 70 sq. in.
c 48 sq. in.
d 74 sq. in.
e None

(53)

---

54. A house, valued at $8,000, was insured for 75% of its value. The rate of insurance was 25 cents per $100. What was the amount of the premium?

a $15.00
b $115.00
c $150.00
d $20.00
e None

(54)

---

55. Tom's father bought a dining room set. The list price was $200 and 2 discounts were given: one of 20% and another of 10%. What did the dining room set cost Tom's father?

a $220.00
b $144.00
c $230.00
d $170.00
e None

(55)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 3 — Sec. C Score (number right)............................

TEST 4 — SECTION D

DIRECTIONS: Do these problems in addition. Then mark the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Finish each column before going on to the next. Be sure to reduce fractions to lowest terms. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

(56)

$$\begin{array}{r} 264 \\ +\,323 \\ \hline \end{array}$$

a 541
b 941
c 547
d 581
e None

(56)

(57)

$$\begin{array}{r} 406 \\ +\,230 \\ \hline \end{array}$$

a 363
b 176
c 636
d 736
e None

(57)

(58)

$$\begin{array}{r} 47 \\ +\,45 \\ \hline \end{array}$$

a 82
b 92
c 97
d 2
e None

(58)

(59)

$$\begin{array}{r} 27 \\ 38 \\ 51 \\ +\,74 \\ \hline \end{array}$$

a 190
b 180
c 910
d 91
e None

(59)

(60)

$$\begin{array}{r} 4762 \\ 9374 \\ 1298 \\ +\quad 307 \\ \hline \end{array}$$

a 14751
b 14714
c 15471
d 15741
e None

(60)

(61)

$$\begin{array}{r} \$\,56.35 \\ 3.68 \\ 12.75 \\ +\quad 8.15 \\ \hline \end{array}$$

a $60.94
b $79.73
c $80.93
d $69.88
e None

(61)

(62)

$30.00 + $.12 + $4 + $1.90 =

a $32.06
b $36.02
c $36.20
d $33.60
e None

(62)

(63)

$$\begin{array}{r} \frac{1}{4} \\ +\,\frac{1}{4} \\ \hline \end{array}$$

a 42
b $\frac{1}{16}$
c 0
d $\frac{1}{2}$
e None

(63)

(64)

$$\begin{array}{r} \frac{1}{5} \\ +\,\frac{1}{10} \\ \hline \end{array}$$

a $\frac{3}{10}$
b $\frac{2}{15}$
c $\frac{1}{3}$
d $\frac{1}{6}$
e None

(64)

(65)

$$\begin{array}{r} 15 \\ +\;\;2\frac{2}{3} \\ \hline \end{array}$$

a $13\frac{1}{3}$
b $12\frac{1}{3}$
c $17\frac{2}{3}$
d $18\frac{2}{3}$
e None

(65)

(66)

$$\begin{array}{r} \frac{7}{8} \\ +\,4\frac{1}{2} \\ \hline \end{array}$$

a $4\frac{3}{8}$
b $5\frac{3}{8}$
c $4\frac{7}{16}$
d $5\frac{5}{16}$
e None

(66)

(67)

$$\begin{array}{r} 12\frac{1}{4} \\ +\,3\frac{1}{3} \\ \hline \end{array}$$

a $15\frac{7}{12}$
b $15\frac{2}{7}$
c $9\frac{1}{12}$
d $9\frac{1}{4}$
e None

(67)

(68)

$$\begin{array}{r} 3\frac{4}{5} \\ +\,4\frac{5}{6} \\ \hline \end{array}$$

a $7\frac{1}{30}$
b $7\frac{9}{11}$
c $8\frac{19}{30}$
d $8\frac{9}{30}$
e None

(68)

(69)

$$\begin{array}{r} 53\frac{1}{2} \\ 12\frac{2}{3} \\ +\,32\frac{3}{4} \\ \hline \end{array}$$

a $97\frac{7}{9}$
b $98\frac{11}{12}$
c $97\frac{23}{12}$
d $97\frac{6}{14}$
e None

(69)

(70)

$5\frac{1}{2} + 3.5 =$

a 9
b $8\frac{3}{5}$
c 2
d $17\frac{1}{4}$
e None

(70)

(71)

$.13\frac{1}{3} + 14.2 =$

a 31.125
b 14.25
c $14\frac{1}{3}$
d 15.625
e None

(71)

(72)

$.04 + .143 + .3706 =$

a 5536
b .5436
c .4536
d .5536
e None

(72)

(73)

$47.6 + 7.32 + .0574 + 6 =$

a 60.9774
b 61.9774
c 61.4779
d 60.7994
e None

(73)

(74)

10% of 30 + 10% of 90 =

a 27
b –6
c 12
d 6
e None

(74)

(75)

$$\begin{array}{r} \text{7 yd. 2 ft. 8 in.} \\ +\;\text{4 yd. 3 ft. 7 in.} \\ \hline \end{array}$$

a 11 yd. 5 in.
b 12 yd. 1 in.
c 3 yd. 3 in.
d 13 yd. 3 in.
e None

(75)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 — Sec. D Score
(number right)

TEST 4 — SECTION E

DIRECTIONS: Do these problems in subtraction. Then mark the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Finish each column before going on to the next. Be sure to reduce fractions to lowest terms. Remember that these are problems in subtraction.

(76)

$$\begin{array}{r} 387 \\ \underline{252} \end{array}$$

a 135
b 639
c 125
d –97524
e None

______ (76)

(77)

$$\begin{array}{r} 458 \\ \underline{106} \end{array}$$

a 564
b 352
c 302
d 664
e None

______ (77)

(78)

$$\begin{array}{r} 71 \\ \underline{27} \end{array}$$

a 98
b –1917
c 58
d 54
e None

______ (78)

(79)

$$\begin{array}{r} 2370 \\ \underline{1890} \end{array}$$

a 460
b 840
c 4800
d 480
e None

______ (79)

(80)

$$\begin{array}{r} 8507 \\ \underline{2939} \end{array}$$

a 5568
b 9446
c 10436
d 6678
e None

______ (80)

(81)

$$\begin{array}{r} \$\,17.25 \\ \underline{1.45} \end{array}$$

a \$18.70
b \$15.80
c \$16.80
d \$18.50
e None

______ (81)

(82)

\$200 – \$14.25 =

a \$214.25
b \$5.75
c \$185.75
d \$20,014.25
e None

______ (82)

(83)

$$\begin{array}{r} \frac{1}{3} \\ \underline{\frac{1}{3}} \end{array}$$

a 0
b $\frac{2}{3}$
c $\frac{1}{9}$
d $-\frac{1}{3}$
e None

______ (83)

(84)

$$\begin{array}{r} \frac{2}{5} \\ \underline{\frac{1}{5}} \end{array}$$

a $\frac{3}{5}$
b $\frac{1}{5}$
c $-\frac{1}{5}$
d $\frac{3}{25}$
e None

______ (84)

(85)

$$\begin{array}{r} \frac{3}{4} \\ \underline{\frac{1}{8}} \end{array}$$

a $\frac{7}{8}$
b $\frac{5}{8}$
c $-\frac{7}{8}$
d $-\frac{5}{8}$
e None

______ (85)

(86)

$$\begin{array}{r} \frac{4}{5} \\ \underline{\frac{1}{4}} \end{array}$$

a $1\frac{1}{20}$
b $\frac{1}{4}$
c $\frac{11}{20}$
d $\frac{3}{5}$
e None

______ (86)

(87)

$$\begin{array}{r} 7\frac{3}{7} \\ \underline{6\phantom{\frac{3}{7}}} \end{array}$$

a $1\frac{3}{7}$
b $13\frac{3}{7}$
c $-1\frac{3}{7}$
d $-13\frac{3}{7}$
e None

______ (87)

(88)

$$\begin{array}{r} 9\phantom{\frac{1}{3}} \\ \underline{5\frac{1}{3}} \end{array}$$

a $3\frac{2}{3}$
b $4\frac{2}{3}$
c $14\frac{1}{3}$
d $-45\frac{1}{3}$
e None

______ (88)

(89)

$$\begin{array}{r} 33\frac{1}{8} \\ \underline{11\frac{3}{8}} \end{array}$$

a $21\frac{3}{4}$
b $22\frac{1}{4}$
c $44\frac{1}{2}$
d $-44\frac{1}{2}$
e None

______ (89)

(90)

$30.6 - 5\frac{1}{2} =$

a 31
b 25.1
c $25.5\frac{1}{2}$
d 36
e None

______ (90)

(91)

$55\frac{4}{5} - 12.22 =$

a 43.58
b 68.12
c 43.68
d –67.02
e None

______ (91)

(92)

$86.350 - 24.15 =$

a 83.935
b 62.2
c 110.50
d 88.765
e None

______ (92)

(93)

$57.09 - 7.0435 =$

a 64.1335
b –26.655
c 50.0465
d 54.1335
e None

______ (93)

(94)

$\frac{1}{6}$ of 30 – $\frac{1}{4}$ of 8 =

a 38
b 24
c 3
d 7
e None

______ (94)

(95)

$$\begin{array}{r} \text{5 da. 6 hr. 20 min.} \\ \underline{\text{3 da. 8 hr. 40 min.}} \end{array}$$

a 8 da. 15 hr.
b 8 da. 14 hr.
c 2 da. 2 hr. 20 min.
d 1 da. 21 hr. 40 min.
e None

______ (95)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 — Sec. E Score
(number right) ....

TEST 4—SECTION F

DIRECTIONS: Do these problems in multiplication. Then mark the letter of each correct answer. Finish each column before going on to the next. Be sure to reduce fractions to lowest terms.

(96)

$$\begin{array}{r} 2\ 3\ 3 \\ \times\ \ \ \ \ 5 \\ \hline \end{array}$$

- a 1165
- b 238
- c 1155
- d 228
- e None

(96)

(97)

$$\begin{array}{r} 4\ 0\ 0 \\ \times\ \ \ \ \ 3 \\ \hline \end{array}$$

- a 403
- b 1200
- c $133\frac{1}{3}$
- d 397
- e None

(97)

(98)

$$\begin{array}{r} 6\ 0\ 9 \\ \times\ \ \ \ \ 6 \\ \hline \end{array}$$

- a 3615
- b 603
- c 3654
- d 101.5
- e None

(98)

(99)

$$\begin{array}{r} 4\ 8\ 6 \\ \times\ \ \ 3\ 2 \\ \hline \end{array}$$

- a 518
- b 454
- c $15\frac{3}{16}$
- d 15552
- e None

(99)

(100)

$$\begin{array}{r} 7\ 3\ 6 \\ \times\ \ \ 2\ 0 \\ \hline \end{array}$$

- a 14720
- b 756
- c 716
- d 1472
- e None

(100)

(101)

$$\begin{array}{r} 5\ 0\ 0 \\ \times\ \ \ 4\ 0 \\ \hline \end{array}$$

- a 540
- b 20000
- c 450
- d 12.5
- e None

(101)

(102)

$$\begin{array}{r} 5\ 0\ 2\ 3 \\ \times\ \ \ \ 8\ 0\ 7 \\ \hline \end{array}$$

- a 5830
- b 4503651
- c 4053561
- d 4216
- e None

(102)

(103)

$$7 \times \frac{1}{5} =$$

- a $1\frac{2}{5}$
- b $7\frac{1}{5}$
- c $\frac{5}{7}$
- d $7\frac{2}{5}$
- e None

(103)

(104)

$$\frac{1}{2} \times \frac{1}{2} =$$

- a $\frac{3}{5}$
- b $\frac{1}{4}$
- c $\frac{1}{2}$
- d $\frac{2}{5}$
- e None

(104)

(105)

$$\frac{1}{3} \times \frac{3}{5} =$$

- a 5
- b $\frac{1}{3}$
- c $\frac{1}{5}$
- d $\frac{1}{2}$
- e None

(105)

(106)

$$\frac{4}{5} \times \frac{5}{8} =$$

- a $\frac{9}{13}$
- b 2
- c $\frac{9}{40}$
- d $\frac{1}{2}$
- e None

(106)

(107)

$$6 \times 2\frac{2}{3} =$$

- a 16
- b $8\frac{2}{3}$
- c $\frac{1}{16}$
- d $16\frac{2}{3}$
- e None

(107)

(108)

$$6\frac{3}{5} \times \frac{2}{3} =$$

- a $6\frac{5}{8}$
- b $4\frac{2}{5}$
- c $5\frac{2}{3}$
- d $6\frac{3}{5}$
- e None

(108)

(109)

$$4\frac{1}{4} \times 6\frac{2}{3} =$$

- a $24\frac{1}{6}$
- b $10\frac{7}{12}$
- c $28\frac{1}{3}$
- d $27\frac{7}{12}$
- e None

(109)

(110)

$$\begin{array}{r} 5\ 4\frac{5}{6} \\ \times 1\ 3\ \ \ \\ \hline \end{array}$$

- a $710\frac{3}{5}$
- b $41\frac{5}{6}$
- c $4\frac{2}{5}$
- d $712\frac{5}{6}$
- e None

(110)

(111)

$$\begin{array}{r} 3\ 6.2\ 5 \\ \times\ \ \ \ \ \ \ \ 5\frac{1}{5} \\ \hline \end{array}$$

- a 188.5
- b $188\frac{1}{5}$
- c $725\frac{1}{5}$
- d 18.85
- e None

(111)

(112)

$$\begin{array}{r} 4\ 8\ 2.5 \\ \times\ \ \ \ \ \ \ 4 \\ \hline \end{array}$$

- a 482.1
- b 1930
- c 482.9
- d 193
- e None

(112)

(113)

$$\begin{array}{r} 3\ 2.3 \\ \times\ .0\ 3\ 5 \\ \hline \end{array}$$

- a 11.3
- b 3.58
- c 1.1305
- d 2.88
- e None

(113)

(114)

6 × 30% of 30 =

- a 54
- b 12
- c 3
- d 24
- e None

(114)

(115)

$$\begin{array}{r} \text{3 yd. 4 ft. 7 in.} \\ \times 4 \\ \hline \end{array}$$

- a 12 yd. 11 in.
- b 18 yd. 4 in.
- c 13 yd. 1 ft. 11 in.
- d 18 yd. 1 ft. 4 in.
- e None

(115)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 — Sec. F Score
(number right)

TEST 4—SECTION G

DIRECTIONS: Do these problems in division. Then mark the letter of each correct answer. Finish each column before going on to the next. Be sure to express remainders as fractions and reduce fractions to lowest terms.

(116) $6\overline{)24}$

a 4
b 18
c 30
d 144
e None

______ (116)

(117) $7\overline{)70}$

a 77
b $\frac{1}{10}$
c 63
d 10
e None

______ (117)

(118) $4\overline{)248}$

a 244
b 62
c 252
d 992
e None

______ (118)

(119) $5\overline{)535}$

a 540
b 530
c 135
d 107
e None

______ (119)

(120) $42\overline{)8610}$

a 8652
b 8568
c 205
d 215
e None

______ (120)

(121) $400\overline{)8000}$

a 32
b 20
c 84
d 48
e None

______ (121)

(122) $34\overline{)3262}$

a 3228
b 3296
c $95\frac{16}{17}$
d 9561
e None

______ (122)

(123) $1 \div \frac{1}{4} =$

a $\frac{1}{4}$
b 4
c $1\frac{1}{4}$
d $4\frac{1}{4}$
e None

______ (123)

(124) $\frac{1}{5} \div 2 =$

a 2
b $\frac{2}{5}$
c $\frac{1}{10}$
d 5
e None

______ (124)

(125) $6 \div \frac{4}{5} =$

a $6\frac{4}{5}$
b $7\frac{1}{2}$
c $5\frac{1}{4}$
d $4\frac{4}{5}$
e None

______ (125)

(126) $\frac{2}{3} \div \frac{2}{3} =$

a $\frac{4}{9}$
b $\frac{1}{10}$
c 1
d $\frac{1}{3}$
e None

______ (126)

(127) $\frac{3}{4} \div \frac{1}{4} =$

a $\frac{3}{16}$
b 3
c $\frac{1}{2}$
d 2
e None

______ (127)

(128) $5\frac{3}{4} \div \frac{3}{8} =$

a $15\frac{1}{3}$
b $5\frac{3}{8}$
c $6\frac{1}{4}$
d $2\frac{5}{32}$
e None

______ (128)

(129) $6\frac{3}{4} \div 2\frac{1}{3} =$

a $3\frac{1}{3}$
b $8\frac{11}{12}$
c $4\frac{1}{12}$
d $2\frac{25}{28}$
e None

______ (129)

(130) $120 \div 1\frac{1}{5} =$

a $118\frac{4}{5}$
b $121\frac{1}{5}$
c 100
d 10
e None

______ (130)

(131) $5\overline{)95\frac{3}{4}}$

a $90\frac{3}{4}$
b $100\frac{3}{4}$
c $19\frac{3}{4}$
d $19\frac{3}{20}$
e None

______ (131)

(132) $.04\overline{)8}$

a 48
b .32
c 200
d 84
e None

______ (132)

(133) $3\overline{)5.04}$

a 5.07
b 1.68
c 5.34
d 5.01
e None

______ (133)

(134) $.03\overline{).504}$

a .507
b 1.68
c 16.8
d 168
e None

______ (134)

(135) $\frac{1}{2}$ of $12 \div \frac{1}{4}$ of $8 =$

a 7
b 3
c 4
d 12
e None

______ (135)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 — Sec. G Score
(number right) ....

Language

INSTRUCTIONS TO STUDENTS:

This is a language test. In taking it you will show what you know about capitalization, punctuation, and words and sentences, and how well you can spell. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

TEST 5—SECTION A

DIRECTIONS: In most lines of the story and sentences below, four words have a number above the first letter. If ONE of the letters should be a capital, mark its number. If none of the four letters should be a capital, mark N, which stands for None. Not more than one letter with a number over it should be a capital on any one line.

		Correct Test Booklet Mark		Correct Answer Sheet Mark
SAMPLE: A.	The $\overset{1}{\text{winner}}$ of the $\overset{2}{\text{race}}$ $\overset{3}{\text{was}}$ $\overset{4}{\text{tom}}$.	*4* A	A	1 ☐ 2 ☐ 3 ☐ 4 ▮ N ☐
SAMPLE: B.	He is $\overset{1}{\text{one}}$ of $\overset{2}{\text{my}}$ $\overset{3}{\text{best}}$ $\overset{4}{\text{friends}}$.	*N* B	B	1 ☐ 2 ☐ 3 ☐ 4 ☐ N ▮

In Sample A, the "t" in "tom," which has a 4 above it, should be a capital. Notice how the 4 has been marked. In Sample B, none of the letters with numbers above them should be capitals, so the N has been marked.

STORY

1. $\overset{1}{\text{last}}$ $\overset{2}{\text{night,}}$ I $\overset{3}{\text{read}}$ a $\overset{4}{\text{wonderful}}$ old ____ 1

2. $\overset{1}{\text{book}}$ $\overset{2}{\text{called}}$ *The* $\overset{3}{\textit{adventures}}$ *of Tom Sawyer*, $\overset{4}{\text{by}}$ ____ 2

3. $\overset{1}{\text{author}}$ Samuel $\overset{2}{\text{l.}}$ Clemens. This $\overset{3}{\text{man,}}$ $\overset{4}{\text{who}}$ ____ 3

4. $\overset{1}{\text{is}}$ $\overset{2}{\text{better}}$ known to all of $\overset{3}{\text{his}}$ $\overset{4}{\text{readers}}$ ____ 4

5. $\overset{1}{\text{as}}$ the $\overset{2}{\text{famous}}$ Mark $\overset{3}{\text{twain,}}$ lived many $\overset{4}{\text{years}}$ ____ 5

in Missouri. For my next birthday, which

comes in August, both my mother and my

6. rich $\overset{1}{\text{uncle}}$ Jim have $\overset{2}{\text{promised}}$ to $\overset{3}{\text{buy}}$ $\overset{4}{\text{me}}$ ____ 6

7. $\overset{1}{\text{some}}$ more good $\overset{2}{\text{books}}$ $\overset{3}{\text{written}}$ by $\overset{4}{\text{mr.}}$ Clemens. ____ 7

8. I have $\overset{1}{\text{promised}}$ my $\overset{2}{\text{friend}}$ $\overset{3}{\text{bob,}}$ who $\overset{4}{\text{lives}}$ ____ 8

9. $\overset{1}{\text{close}}$ $\overset{2}{\text{to}}$ $\overset{3}{\text{brooks}}$ Junior High School, $\overset{4}{\text{that}}$ ____ 9

10. $\overset{1}{\text{he}}$ can $\overset{2}{\text{read}}$ $\overset{3}{\text{them}}$ when $\overset{4}{\text{i}}$ have finished. He ____ 10

knows he will always be welcome to do so.

11. $\overset{1}{\text{my}}$ $\overset{2}{\text{teacher}}$ thinks $\overset{3}{\text{that}}$ $\overset{4}{\text{everyone}}$ my ____ 11

GO RIGHT ON TO THE NEXT PAGE

TEST 5—SECTION A (Continued)

12. [1]age should read [2]good [3]books. Last [4]friday ______12

13. she said, [1]“please [2]get one or two [3]good [4]books ______13

from the new Walnut Street Library.

14. If at all [1]possible, [2]you [3]should [4]each do ______14

15. [1]some [2]reading during [3]easter [4]vacation.” ______15

16. Bobby [1]comes from [2]denver, but [3]he [4]has ______16

17. been to [1]ireland and [2]many [3]other [4]countries. ______17

18. He asked, [1]“do [2]you [3]think it [4]will be all ______18

19. [1]right if my older [2]sister and [3]i see if [4]we ______19

can find some books written in French?”

“Oh,” said Mrs. Young, “do you actually

20. [1]read the [2]language [3]that [4]well?” ______20

“No,” said Bobby, “but we might see some

21. [1]pictures of the Seine [2]river and [3]places [4]like ______21

22. the Arch of [1]triumph. We [2]saw [3]both of [4]them on ______22

our vacation last June.”

SENTENCES

23. Tom [1]brown had [2]visited [3]only [4]twice in ______23

24. [1]alaska before [2]he [3]made it his [4]home. ______24

25. On [1]sunday [2]I started [3]for [4]the Rocky Mountains ______25

26. [1]to [2]visit with [3]aunt Nell and her [4]family. ______26

27. [1]we [2]shall [3]travel [4]east to Bagdad. ______27

28. Tom [1]went [2]out. [3]he [4]then saw Jim ______28

29. [1]coming [2]down the [3]long [4]street. ______29

30. Mother [1]said, [2]“please [3]answer the [4]telephone.” ______30

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 5 — Sec. A Score (number right) ......

TEST 5—SECTION B

DIRECTIONS: In the letter and story below, most lines have a number, such as 31, 32, or 33. If a punctuation mark is needed where the number is, make a black mark within the pair of dotted lines under the punctuation mark needed. If no punctuation is needed, make a black mark under the N, which stands for None. Show either apostrophes or single quotation marks in the fourth column. Only one answer should be given for each line.

Correct Test Booklet and Answer Sheet Mark

		,	?	"	'	N
SAMPLE: C. Mary$_1$ will you come with us?	1	●				
SAMPLE: D. The bus$_2$ is leaving at ten o'clock.	2					●

In Sample C, a comma is needed at 1 after the word "Mary," so a mark has been made under the comma in answer row 1. In Sample D, no punctuation mark is needed at 2, so the N has been marked in answer row 2. If you are using an answer sheet, do not mark on this page.

		,	?	"	'	N
303 South Park Street						
Salt Lake City$_{31}$ Utah	31					
June 28, 1956						
Dear Grandmother$_{32}$	32					
It$_{33}$s raining, so I have time to write you a	33					
letter. I was sorry to miss Grandfather$_{34}$s birthday.	34					
The folks decided$_{35}$ we should stay another week.	35					
Did Grandfather get my birthday present on time$_{36}$	36					
Don$_{37}$ Ann, and Mary helped me select it.	37					
Yes$_{38}$ we do like it here, but we hope	38					
it won$_{39}$t keep on raining. That would spoil the	39					
picnic that our favorite cousin$_{40}$ Harry, planned.	40					
Yesterday he said, "It will probably rain!$_{41}$	41					

GO RIGHT ON TO THE NEXT PAGE

TEST 5—SECTION B (Continued)

However$_{42}$ I'm sure it will turn out to be a beautiful day. Don't you think it is best to look on the bright side$_{43}$ In Walt Disney's film, $_{44}$*Pinocchio,* Jiminy Cricket seemed to think that was a good idea, didn't he$_{45}$

The day after we saw the picture, Harry$_{46}$s new music teacher said$_{47}$ "Do you remember when Jiminy Cricket sang that pretty song$_{48}$ 'When You Wish Upon A Star$_{49}$? If you like, I'll teach you to play it on the piano.$_{50}$

Grandmother$_{51}$ do you have Aunt Ida's new address$_{52}$ Mother has lost it, and I want to send her a post card before we leave.

Well$_{53}$ wish us good luck on our trip back.

Love$_{54}$

Barbara$_{55}$

42 , ? " ' N
43 , ? " ' N
44 , ? " ' N
45 , ? " ' N
46 , ? " ' N
47 , ? " ' N
48 , ? " ' N
49 , ? " ' N
50 , ? " ' N
51 , ? " ' N
52 , ? " ' N
53 , ? " ' N
54 , ? " ' N
55 , ? " ' N

STORY

Returning from a fishing trip$_{56}$ the boys met Tom, who said, "Where have you been$_{57}$"

"We$_{58}$ have been camping down by the river,$_{59}$ answered Ned. "We did some fishing."

56 , ? " ' N
57 , ? " ' N
58 , ? " ' N
59 , ? " ' N

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 5 — Sec. B Score (number right)

TEST 5—SECTION C

DIRECTIONS: Mark the number of the correct or better word in each sentence below.

	Correct Test Booklet Mark	Correct Answer Sheet Mark
SAMPLE: E. She (^{1}ain't ^{2}isn't) as tall as Betty.	2 E	E ^{1} ^{2} ‖

In Sample E, the word in the parentheses with the 2 by it, "isn't," is the better word. Notice how the 2 has been marked.

60. He let (^{1}hisself ^{2}himself) in the door quietly. ____60

61. Yesterday Ruth (^{1}says ^{2}said), "Let's study together." ____61

62. Adverbs (^{1}do not always ^{2}always) end in "ly." ____62

63. Everybody (^{1}has ^{2}have) fun at the annual festival. ____63

64. I think that Janet writes (^{1}good ^{2}well). ____64

65. It was (^{1}their ^{2}there) book that was lost. ____65

66. I have (^{1}chose ^{2}chosen) the material for my dress. ____66

67. If I had seen him, I (^{1}could of ^{2}could have) warned him. ____67

68. It is (^{1}true ^{2}false) that pronouns may be singular or plural. ____68

69. We were told that a boy (^{1}drowned ^{2}drownded) there. ____69

70. They (^{1}saw ^{2}seen) to it that he got the reward. ____70

71. The word "everyone" is (^{1}a proper noun ^{2}an indefinite pronoun). ____71

72. They thought the party was for Dave and (^{1}him ^{2}he). ____72

73. A pen and a bottle of ink (^{1}are ^{2}is) on the table. ____73

74. In the title "Gone with the Wind," the word "Wind" is (^{1}a noun ^{2}an adjective). ____74

75. (^{1}Us ^{2}We) girls bought our hats at the same store. ____75

76. When the raft (^{1}sank ^{2}sunk), we yelled for help. ____76

GO RIGHT ON TO THE NEXT PAGE

TEST 5 — SECTION C (Continued)

77. Each of the three boys thought his knife was the (^{1} better ^{2} best). ______77

78. In "a good fight," the word "good" is an (^{1} adverb ^{2} adjective). ______78

79. Science and math (^{1} require ^{2} requires) careful study. ______79

80. The word "blue," when used to describe the color of a dress, is an (^{1} adverb ^{2} adjective). ______80

81. In taking a rest, children should (^{1} lie ^{2} lay) quietly. ______81

82. There (^{1} was ^{2} were) several tickets left. ______82

83. Mrs. Jones gave the sack of candy to her and (^{1} I ^{2} me). ______83

84. It is (^{1} true ^{2} false) that a word may function as more than one part of speech. ______84

85. "The man (^{1} who ^{2} which) sang" is correct English. ______85

86. It has not been touched by (^{1} she ^{2} her) or John. ______86

87. He looked as if he had (^{1} ran ^{2} run) all the way. ______87

✓ For each statement below that is a complete sentence, mark YES; for each that is not, mark NO.

88. The female of the species is supposed to be deadlier than the male. **YES NO** 88

89. After watching carefully for about twenty minutes. **YES NO** 89

90. When we reached a position near the summit. **YES NO** 90

91. The star of the show appeared to take several bows. **YES NO** 91

92. When the problem is one of addition. **YES NO** 92

93. With a faith that leads us to worship the specialist. **YES NO** 93

94. Great caravan routes lead to Damascus. **YES NO** 94

95. To spend a lifetime with a woman as sweet and understanding as your mother, through depression and prosperity, through sickness and health. **YES NO** 95

96. When the pupil does not understand what he is aiming to accomplish in algebra or geometry and is carried along for a time by the demands of the teacher. **YES NO** 96

97. Big and small, lean and fat, they all came. **YES NO** 97

98. While the eyes of the children were wide with fear, and the boy kept on with the ghost story. **YES NO** 98

99. As the huge ship slowly limped into port and the men cheered. **YES NO** 99

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 5 — Sec. C Score
(number right)

TEST 6

DIRECTIONS: Each line in this test contains four spelling words and the word, None. These words are numbered 1, 2, 3, 4, and the None is numbered 5. In some of the lines, one word is misspelled. In others, no word is misspelled. If there is a misspelled word, mark its number. If no word is misspelled, mark the 5.

							Correct Test Booklet Mark		Correct Answer Sheet Mark 1	2	3	4	5
SAMPLE:	F.	1 now	2 just	3 come	4 ron	5 None	4 F	F	⁞	⁞	⁞	▮	⁞
SAMPLE:	G.	1 go	2 see	3 do	4 may	5 None	5 G	G	⁞	⁞	⁞	⁞	▮

100.	1 score	2 rathur	3 lame	4 bitter	5 None	______100
101.	1 soak	2 really	3 escape	4 often	5 None	______101
102.	1 sipply	2 nature	3 loose	4 promise	5 None	______102
103.	1 split	2 elephunt	3 niece	4 sixty	5 None	______103
104.	1 entire	2 trout	3 losing	4 lisened	5 None	______104
105.	1 lantern	2 faint	3 motion	4 arrest	5 None	______105
106.	1 moral	2 sentury	3 haste	4 compel	5 None	______106
107.	1 tried	2 woolen	3 peech	4 shining	5 None	______107
108.	1 safety	2 dreamed	3 careless	4 unles	5 None	______108
109.	1 asist	2 special	3 weight	4 paddle	5 None	______109
110.	1 funny	2 takeing	3 until	4 alone	5 None	______110
111.	1 obedient	2 register	3 target	4 sesion	5 None	______111
112.	1 suburb	2 laboratory	3 carear	4 efficiency	5 None	______112
113.	1 pantry	2 wistle	3 insect	4 willow	5 None	______113
114.	1 mortal	2 salute	3 evidance	4 estate	5 None	______114
115.	1 moskuito	2 singular	3 hymn	4 drama	5 None	______115
116.	1 tangle	2 presence	3 intense	4 prairy	5 None	______116
117.	1 evil	2 detail	3 justise	4 amuse	5 None	______117
118.	1 foreign	2 examenation	3 accent	4 diamond	5 None	______118
119.	1 horrid	2 strain	3 orphan	4 investegate	5 None	______119
120.	1 lease	2 expand	3 misterious	4 cucumber	5 None	______120
121.	1 swich	2 paw	3 sleeve	4 noisy	5 None	______121
122.	1 disposition	2 brilliant	3 magnifecent	4 accord	5 None	______122
123.	1 remit	2 oxygan	3 interfere	4 delicious	5 None	______123
124.	1 stubborn	2 permanent	3 campain	4 indifferent	5 None	______124
125.	1 silence	2 vegtable	3 patient	4 mere	5 None	______125
126.	1 aerial	2 individual	3 exquisite	4 convict	5 None	______126
127.	1 scaucer	2 unable	3 sow	4 prison	5 None	______127
128.	1 amiable	2 seiges	3 beneficial	4 chaperon	5 None	______128
129.	1 strenuous	2 accrued	3 infamy	4 melencholy	5 None	______129

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 6 Score (number right) ....

(The quick brown fox just came over to greet the lazy poodle.)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Grade Placement

Name .... Last .... First .... Middle .... Grade .... Sex M-F

School .... City .... Date of Test ...... Month ...... Day ...... Year

Teacher or Examiner .... (............) Student's Age .... Date of Birth ...... Month ...... Day ...... Year

California Achievement Tests

Junior High Level • GRADES 7-8-9 • Form W

DEVISED BY ERNEST W. TIEGS AND WILLIS W. CLARK

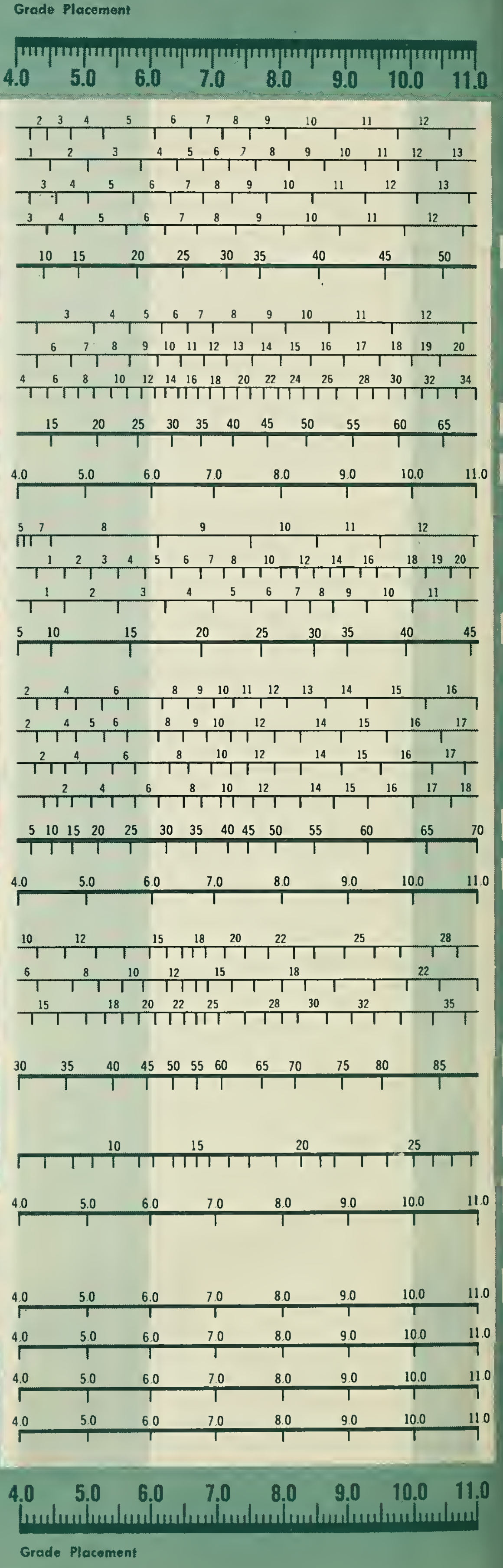
See MANUAL for instructions.

TEST	SECTION	POSSIBLE SCORE	STUDENT'S SCORE
1. READING VOCABULARY	A. Mathematics	15	
	B. Science	15	
	C. Social Science	15	
	D. General	15	
	TOTAL (A+B+C+D)	60	
2. READING COMPREHENSION	E. Following Directions	15	
	F. Reference Skills	26	
	G. Interpretations	45	
	TOTAL (E+F+G)	86	
	READING GRADE PLACEMENT		
3. ARITHMETIC REASONING	A. Meanings	15	
	B. Symbols, Rules, and Equations	25	
	C. Problems	15	
	TOTAL (A+B+C)	55	
4. ARITHMETIC FUNDAMENTALS	D. Addition	20	
	E. Subtraction	20	
	F. Multiplication	20	
	G. Division	20	
	TOTAL (D+E+F+G)	80	
	ARITHMETIC GRADE PLACEMENT		
5. MECHANICS OF ENGLISH	A. Capitalization	30	
	B. Punctuation	29	
	C. Word Usage	40	
	TOTAL (A+B+C)	99	
6. SPELLING	TOTAL SPELLING	30	
	LANGUAGE GRADE PLACEMENT		
	Handwriting		
	BATTERY GRADE PLACEMENT		
	CHRONOLOGICAL AGE GR. PL.		
	ACTUAL GRADE PLACEMENT		
	INTELL. (M.A.) GRADE PLACE.		

Grade Placement

Percentile Rank

DIAGNOSTIC PROFILE* (Chart Student's Scores Here)



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*For an interpretation of green area within Profile, see discussion on Articulation in Part 4 of Manual.

†Column designed for recording Expected Grade Placements, Anticipate Grade Placements, School or Class Averages, etc. See Part 2 of Manua

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